ABSTRACT

DOUGLAS A PATTON
Medicinal Plant Use in the San Luis Valley, Costa Rica: A Proposed *Cuadro Basico*
(Under the direction of DR. JIM AFFOLTER)

In this paper, I define the role of a local medicinal plant garden as an integral component in efforts towards conserving biological diversity while simultaneously conserving cultural diversity. The local medicinal plant garden is a botanic garden that features content focusing on a local culture's use of medicinal plants. The local medicinal plant garden should be implemented amongst other ex-situ and in-situ conservation programs that integrate biological conservation with the local communities that are affected by the conservation measures. The establishment of a local medicinal plant requires an exhaustive study of the local culture, such that the content is accurate and properly targeted to the intended audience. Through the examination of documents that relate to the San Luis valley community's medicinal plant use, I compile a Microsoft Access database of information on medicinal plants. From this database, I extrapolate a proposed *cuadro basico*, a list of a community's most important medicinal plants. I explain the limitations and the relevance of the *cuadro basico* to the San Luis valley medicinal plant garden at the University of Georgia's Ecolodge and Research Station San Luis. This analysis of the San Luis valley community's medicinal plant usage is an early step in the development of the understanding of the exact nature of the role of medicinal plants in the lives of the community members of the San Luis valley.

MEDICINAL PLANT USE IN THE SAN LUIS VALLEY, COSTA RICA: A PROPOSED *CUADRO BASICO*

By

DOUGLAS A PATTON

A Thesis Submitted to the Honors Council of the University of Georgia in Partial Fulfillment of the Requirements for the Degree

BACHELOR OF ARTS

and

HONORS IN ANTHROPOLOGY

Athens, Georgia

2005

MEDICINAL PLANT USE IN THE SAN LUIS VALLEY, COSTA RICA: A PROPOSED *CUADRO BASICO*

By

Douglas A Patton

Approved:

Dr. James Affolter 29 June 2005
Dr. James Affolter Date
Major Professor

Approved:

Dr. Virginia Nazarea 29 June 2005
Dr. Virginia Nazarea Date
Reader

Approved:

Dr. David S. Williams 29 June 2005
Dr. David S. Williams Date
Director, Honors Program, Foundation Fellows, and
Center for Undergraduate Research Opportunities

Approved:

Dr. Pamela B. Kleiber 29 June 2005
Dr. Pamela B. Kleiber Date
Associate Director, Honors Program and
Center for Undergraduate Research Opportunities

ACKNOWLEDGEMENTS

First, I would like to thank my faculty mentor and thesis advisor, Dr. Jim Affolter. Without his patience in providing me with guidance and advice, I would have not been able to complete this thesis. I would also like to thank Dr. Jim Affolter for his confidence in me and for providing me with the great opportunity that my research and thesis writing has been. I also would like to thank Dr. Virginia Nazarea for her assistance and valuable time as my thesis reader.

Second, I would like to thank Jim Lewis and The Friends of the State Botanical of Garden for their generosity in providing funding for my trip to the San Luis valley, Costa Rica. The trip made it possible for me to greatly increase the value of this work by obtaining advice from Costa Rican medicinal plant experts, Jorge Arce Portuguez, Professor at EARTH University in Costa Rica, and Hernán Rodríguez Navas, Costa Rican medicinal plant expert and author. Their review of my initially proposed *cuadro basico* greatly enhanced my confidence and satisfaction with my work; for their time and advice, I am very thankful.

My stay in the San Luis valley was made logistically possible and undeniably pleasurable by the kindness and generosity of Paul Duncan, who in addition to hosting the meeting of the Network of Latin American Ethnobotanical Sisters Gardens, extended his busy schedule to make my trip a success. For Paul Duncan's help and for the assistance and friendship the other conference attendees extended to me, I am very thankful.

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS.....iii

INTRODUCTION.....1

CHAPTER

1 CONSERVATION.....2

In-Situ Conservation.....2

Ex-Situ Conservation.....9

Education.....12

Research Opportunities.....14

Equitable Benefits.....16

Disadvantages of Ex-Situ Collections.....19

Two Ex-Situ Conservation Programs.....22

Conclusion.....29

2 MEDICINAL PLANT USE IN THE SAN LUIS VALLEY.....31

Purpose.....32

Methodology.....32

The *Cuadro Basico*.....34

Discussion.....35

Conclusion.....37

WORKS CITED.....39

APPENDICES

Appendix A: Medicinal Plant Species List….....43

Appendix B. The Proposed Cuadro Basico….....50

Appendix C: Proposed *Cuadro Basico* and

the San Luis Valley medicinal plant garden.....121

Introduction

The use of medicinal plants constitutes an important portion of the healthcare options for the majority of the people in the world. In many cultures, the knowledge about medicinal plant use is preserved primarily through oral traditions. As influences of globalism expand and compete with traditional knowledge and deforestation threatens biodiversity, the codification of traditional local knowledge and the conservation of natural resources will help to ensure that local peoples continue to have access to medicinal plants and medicinal plant use information.

The residents of the San Luis valley, Costa Rica use medicinal plants in their daily lives. Alongside the residents the University of Georgia runs the Ecolodge and Research Station San Luis. The ecolodge and research station is favorably situated to establish and promote programs to benefit the local residents with respect to their medicinal plant use. The facilities at the Ecolodge and Research Station feature a botanical garden with a medicinal plant garden. Herein I first examine the role of a local medicinal plant garden as a conservation method and then examine data on medicinal plant use to propose a San Luis valley *cuadro basico*.

CHAPTER 1

CONSERVATION

The conservation of plant resources serves a variety of purposes to a variety of groups. Various systems for creating an in-situ reserve or ex-situ collection exist. In the former the plants exist in their natural habitat, surrounded by other naturally growing plants and organisms. The ex-situ collection differs from an in-situ reserve in that with an ex-situ collection, some sort of intentional human activity results in a selection of plants growing outside their original habitat. Here I will examine the potential benefits and disadvantages of each of the two conservation paradigms with an emphasis on the conservation of medicinal plants.

In-Situ Conservation

For years, the public has been hearing about the rapid destruction of old growth forests in the highly biodiverse tropics. Anthropologic reviews of various deforestation practices have shown many to be sustainable systems of land use succession, and furthermore some traditional systems have even been shown to improve plant species biodiversity (Fairhead & Leech 1996). On the other hand, timber and other commercial interests that reach markets far beyond immediate localities have certainly endangered a number of species of plants and animals; some communities, such as the Peruvian Rivereño villages, have established communal forest reserves, and the community members themselves protect the forest from commercial extraction (Pinedo-Vasquez et al. 1990). Proponents of biodiversity conservation have frequently argued for the merits

of in-situ conservation, noting the immensely complex nature of an ecosystem and the intrinsic importance of natural spaces. Additionally, botanical gardens and seed banks cannot easily accommodate the same genetic diversity within and among species as forest preserves (Maunder et al. 2001). The only way to guarantee the preservation of all the species in an ecosystem is to create areas of the ecosystem that are protected from harmful exploitation or overuse.

Two variables for In-Situ conservation: access and education

In-situ conservation can occur in multiple ways. Because an area that is a focus for conservation efforts is likely to be used and in some ways stressed by local populations, different levels of management will have varying effects on local peoples. Management can vary from protective preserves, where no human use of the land is allowed other than through strictly monitored authorizations, to reserves with guidelines set and education programs in place to foster a system that permits sustainable use (Sheldon et al. 1997). The first system relies on enforcement and may deprive some people of a source of well-being. The second system relies on education and requires substantial initial knowledge of the available species and the local ecosystem dynamics.

Restricted access

Recent studies have noted an accelerated pace of land use succession (Steinberg 1998). As people shift towards cash economies, fertilizers and other inputs bring benefits that appear to outweigh the benefits of conventional succession practices. These inputs allow farmers to shorten or eliminate the fallow cycle and produce crops more frequently on a piece of land, which appears to be economically adventitious. Few obvious short-

term incentives exist that reward those who allow long fallow periods of twenty years or more. The benefits of secondary forests and other disturbed lands that result from lengthy succession cycles often do not have the simple ties to a cash economy that cash crops have (Steinberg 1998). Accordingly, the raw materials, especially medicinal plants, that were formerly abundant and continually renewed by lands in varying levels of succession can become scarce. The remaining areas where people can harvest the plants they need will experience increased pressure as supplies decrease.

One solution is to select areas of land and limit human access, thus creating a preserve. Lands that have been designated as preserves and which strongly limit human use have created several problems; these problems are especially severe for local peoples who formerly relied on those lands. Detriment will often be most severe for local families living in relative poverty, because medicinal plants constitute a very important component of traditional healthcare for many people in the world, and alternative healthcare solutions may be costly (Pei 2001; Sheldon et al. 1997). Commonly, wild harvest is the only option for these peoples, and when cultivation is available, plants or plant parts harvested form the wild are often considered to have greater efficacy as a medicinal (Hamilton 2004; Schippmann et al. 2002). Eliminating local areas that are used for extraction of plant resources will limit people's access to plants that are harvested from the wild, and this may result in both decreased healthcare options for rural people, and economic detriment for those who rely on trade in wild harvested medicinal plants (Hamilton 2004).

Additionally, when people rely on a resource and the resource is suddenly restricted, some level of enforcement of the restrictions will likely be necessary. Such enforcement requires both money to fund the enforcement and turns what may have been

a vital aspect of a people's relationship with their surrounding landscape into criminal or punishable behavior. Policy makers must consider whether the benefits of low or zero local access to in-situ land reserves outweighs the disadvantages, especially when considering the alternative methods of conservation.

Local education

In-situ conservation paradigms that promote sustainability and responsible use with education offer many advantages. The costs of such systems lie within the two problems, first of gathering knowledge that is appropriate to a particular locale, and second implementing education programs that distribute this knowledge to local peoples who would use this knowledge to achieve goals of sustainable harvest. This knowledge must be particular to the local culture and local species that are available.

Knowledge of local species will typically focus on either or both of two variables, the economic usefulness of a plant and a plant's status as a rare or endangered species. Traditional botanical gardens have often focused on the first variable for research purposes and most conservation efforts have focused on the second variable as the primary or sole criteria for considering the urgency of monitoring a plant species (Heywood 1987; Raven 1987).

Endangered Species

Environmentalist rhetoric of endangered species and the fear of extinction has thoroughly captured the American public's attention, yet concerns over biodiversity are nearly non-existent (Nabhan 1995). This skewed awareness comes from the public's lack of knowledge of the existence of the concept of biodiversity. This oversight has led to

many policies and propositions that focus on protecting individual species that have been identified as marginalized, endangered or extinct, a result usually attributed to human pressures (Meilleur 1991). Thousands of botanical gardens throughout the world maintain large collections of plants. Due to the popular emphasis on protecting endangered species, high priority has recently been often given to plants that are rare or in danger of extinction. This happens with good reason, for if living specimens and genes are not maintained prior to extinction, they may never be available at a later time. Research efforts centered on the species endangerment paradigm will focus on cataloging the species within a preserve, and monitoring the success of the program through ongoing inventories. Programs focusing on protecting high profile endangered species may attract more global attention, and funding may become more readily available.

The Usefulness of a Species

The usefulness of a species to a culture can be a better focus for conservation efforts and monitoring programs (Hamilton 2004). First, species that face extinction pressure are often under such pressure due to human activity and land use (Meilleur 1991). Reserves that focus on conserving economically useful plants will often concomitantly protect endangered plant and animal species (Meilleur 1991), and the extent to which this protection can occur will likely be correlated to the limitations placed on extraction (Mendelsohn and Balick 1995). Second, labeling a species as rare or endangered generally involves such issues on a global scale, such as list generated by the Convention on International Trade in Endangered Species of Fauna and Flora (Hamilton 2004). Because in-situ conservation that focuses on the usefullness of a species to the local culture functions on a local level, plant species that are plentiful globally but under

excessive pressure in an area due to local use will be protected. Third, knowledge of economic uses of a plant can be extended to benefit local people if proper education programs are implemented.

Researchers will most likely find the greatest receptivity on the part of local people to education programs that emphasize the personal economic benefits of sustainable use. Low risk activities that provide medicinal plants to local participants may offset expenses associated with a low supply market and expensive pharmaceuticals. While educational programs can emphasize the community benefits of maintaining sustainable levels of useful plant populations through appropriate harvesting methods, other programs can also teach methods of removing cuttings of certain species from the forest for home garden cultivation.

In addition to creating a social environment that interacts with conservation lands in a sustainable manner, education systems can also promote the economic benefits of longer crop fallow cycles (see Pined-Vasques et. al. 1990). Several studies have shown that secondary forests contain many valuable timber and non-timber products with sustainable harvest cash values greater than for any alternate land use (Peters et al. 1989; Grimes et al. 1994). Additional benefits are also available when more secondary forests are available such as costs for agricultural inputs being reduced or eliminated due to decreased dependency on agriculture and increased availability of organic detritus. Pest management may be facilitated due to shifting fields and increased frequency of natural barriers, and individuals will be able to harvest medicinal plants from an increased quantity and variety of successional stages close to home.

Barriers

Multiple barriers to establishing a successful in-situ reserve exist. Problems stemming from ineffective guidelines, power conflicts, cross-cultural dilemmas, and insufficient funding may appear any time during the existence of a reserve. Awareness of possible problems will provide the greatest chances of success.

Any efforts that attempt to alter a resource's availability to everyone in a community will have numerous side effects. While sustainability through responsible methods of collection may be emphasized, there is no guarantee that individuals will adhere to recommended guidelines. It is also very possible that guidelines will be impractical to follow or inappropriate for local conditions, despite the best intentions of everyone involved. If collection exceeds definitions of sustainability, enforcement plans like those in a preserve may be deemed necessary.

There are also conflicts between local interests and larger, often remote urban interests. While extractive reserves may be sustainably harvested for greater profit, powerful urban interests will benefit more directly if the land is sold to timber companies. If the powerholder of the land is in an urban area, then local interests may lose to the immediate profit available if land is used as timber (Salafsky 1993). In-situ reserves that allow sustainable extraction will ensure that local people do not lose valuable land and non-timber forest products.

Any time an attempt is made to alter the relationships amongst members of a culture or between a society and the environment, numerous results are unforeseeable. Efforts that may appear to offer benefits equitably across multiple socioeconomic levels may upset local economies and create more harm than good. Local healthcare practitioners or groups can be easily alienated, even if they are initially cooperative and

all efforts are made to make intentions clear (Berlin and Berlin 2003). Because these conservation efforts involve an outside group, local people will have a definite entity to blame when problems do occur, possibly overshadowing any of the benefits that are achieved.

Also, available funds will largely determine the extent and quality of research available as well as the amount of resources available to implement education programs. Insufficient knowledge about local practices and local ecology may result in a crippled system that cannot achieve the necessary results.

Ultimately, despite the best efforts to address all variables, intervention can cause far more problems than originally foreseen. Multiple efforts at various levels of in situ conservation are ongoing throughout the globe, especially in the tropics. Communication between the groups that are involved with various efforts will help to maximize the benefits that a program has. Efforts such as the University of Georgia's networking of sister botanical gardens allow for the creation and execution of similar educational programs in different regions (http://www.uga.edu/ethnobot/Sis.htm). Proper follow-through will allow researchers to determine which aspects of particular programs are suitable to different conditions.

Ex-Situ Conservation

The archetypical example of ex-situ conservation is the botanic garden, where plants are conserved as entire living organisms. Throughout the world over 2,000 botanic gardens contain numerous species of plants (Botanic Gardens Conservation International http://www.bgci.org.uk/botanic_gardens/index.html), often focusing on local or regional species (Heywood 1987). These institutions serve multiple functions such as

conservation and education. With modern concerns over species loss, the role of botanic gardens as gene banks for endangered species has become pronounced, although botanic gardens are not always capable of independently conserving a species because of factors such as a species' requirements for breeding population size (Ashton 1987).

The usual distinction between in-situ and ex-situ is the component of human interaction. If plants are growing in a particular way due to human behavior, then the plants are in an ex-situ collection. However, the difference between in-situ reserves and ex-situ collections is often not as clear cut as the difference between a mature or climax forest and a botanic garden. Miguel Altieri et al. (1987) describe traditional agroecosystems as genetically diverse in-situ collections. Other sources describe a similar system, using terms such as "complex agroforest" (see Salafsky 1994). The terms in-situ and ex-situ cannot always provide a clear distinction for the same reason that distinctions such as 'natural' and 'man-made' are problematic, namely because humanity's influence on the world occurs on a continuum of which 'natural' and 'man-made' represent idealized poles.

In some literature, the term circa-situ has been used to distinguish conservation paradigms that do not clearly fall under the categories in-situ and ex-situ. These circa-situ reserves are characteristic of personal or family plant use patterns, usually associated with a traditional culture. These include such systems where plants are growing in or in close proximity to a natural environment alongside other components from the same ecosystem, yet the circumstances are affected by a degree of human control (Hawkes et al. 2001).

Most literature, however, utilizes only the two terms, in-situ and ex-situ. The concept of a circa-situ collection is useful because it emphasizes that human interaction

with the environment occurs to varying extents; humans are not alien to the environment. While the institutionalized botanic garden falls into the category of ex-situ, the local home garden containing locally available plants can be characterized as circa-situ. The circa-situ classification is significant, because it demonstrates the continuum of conservation systems types, which may otherwise be considered opposites.

The Benefits of Ex-Situ Collections

Ex-situ collections contain a selective condensation of the botanic information found within one or more ecosystems. Those who access this information are able to do so with considerably less effort than in the wild. Botanic gardens can offer visitors easily accessible usage information, confirmed species identity to aid in identification, synonymous common names in multiple languages, access to published information, seeds, cuttings and cultivation materials, a place to meet, and a variety of education options.

Additionally, networks of botanic gardens can compile information on a larger scale, provide a variety of services to researchers and students, and distribute cultivation and genetic materials through permanent channels.

Transmission of knowledge from older generations to younger generations has been noted by some studies to be slowing down; in many places younger people do not interact with nature to the extent their elders did, and plant use information is concentrated amongst the elderly (Steinberg 1998). With cooperation and informed consent, researchers can compile traditional medicinal plant usage information, safeguarding against the permanent loss of a culture's valuable knowledge. Once gathered and processed, properly implemented this information can fulfill a variety of goals. Suitable

goals for a local botanical garden are as follows: establish and conduct an education program, promote locally oriented research, provide equitable opportunities across gender and socioeconomic lines, and reinforce systems of traditional knowledge. If these goals are successfully implemented, the local medicinal plant garden may offer greater benefits than in-situ reserves alone.

Education

One important method of sharing the benefits that are accrued with the accumulation of useful cultural information is the education of those in the culture where the information originated. Educational efforts can focus on developing and implementing programs that teach useful plant identification, usage, cultivation, sustainable wild harvest, and when appropriate, the benefits and methods of using a long fallow crop succession system.

The local medicinal plant garden has a unique position in offering educational materials that enable visitors to conveniently learn plant identification. Visitors to the garden can be instructed through literature, labels, and orally on identification of useful plants. Growing samples make the indication of identifying characteristics much clearer than do pictures or descriptions. Simultaneously, synonymous names can be compiled to assist in communication where multiple languages interface. Similar and easily confused species can also be easily pointed out.

Information on usage of plants for medicinal purposes can also be compiled at the garden. Local practitioners and local and non-local researchers would be able to work together to compile information for each plant about collection time, dosage, preparation,

and prescription. This information could be made publicly available, and organized into education programs that reinforced the local culture and sustainability.

In many areas people maintain home gardens where they cultivate plants that fulfill a variety of needs. These gardens vary in diversity, and alongside declines in cultural diversity these gardens will tend to decrease in species diversity (Steinberg 1998). In the case of medicinal plants, new healthcare options can decrease incentives for people to invest time in collecting and cultivating what may have once been vital species. By promoting education about the usefulness of medicinal plants and facilitating cultivation by providing materials, and educating people on the sustainable gathering of cultivation materials, an ethnobotanical garden can greatly enhance the genetic and species diversity of local collections. Local peoples will be better able to expand their own home gardens, and extra plants can be traded or sold to others to increase household income. Programs that allow for trading, collecting and purchasing of seeds and cuttings will help people at all socioeconomic levels to cultivate useful species.

In addition to promoting species diversity through supporting home garden cultivation, the medicinal plant garden can offer education programs that teach methods of sustainable harvest from mature forest areas or controlled reserves. This portion of the education program would complement in-situ reserves that allow sustainable harvesting of certain species. Areas that are not subjec to direct conservation measures would also feel less pressure if people were educated about the benefits of sustainable harvest. Educating people on methods of sustainable harvest will benefit people at all socioeconomic levels, similar to the effects of cultivation programs.

Many groups of people relying on horticulture for their livelihood have developed swidden crop systems. Swidden crop systems are a cycle of land use that allows for

periodic use of land for crops followed by fallow periods, a time when management is minimalized. Modern Western methodology has generally focused on the benefits of only one stage of the cycle, the crops. However, all stages of the cycle offer numerous resources, and many can be sources of income if the appropriate markets are available (Hamilton 2004). However, with availability of inputs such as fertilizers, it has become possible to dramatically shorten successional periods, focusing more time on the crop production period. Other shifts from traditional successional systems, which rely on using slash-and-burn techniques, have also upset traditional sustainable forest management systems (Marjokorpi and Ruikolainen 2002).

Because medicinal plants are an important resource for people without access to pharmaceuticals, eliminating or reducing the variety of successional stages will reduce the availability of medicinal plants. One study of Costa Rican woody medicinal plant species found the greatest abundance of such species in secondary forests (Chazdon et al.1999). It has also been noted that many cultures have a disturbance pharmacopoeia that includes many weedy species, commonly available in areas that had been cleared in recent years (Stepp and Moerman 2001). When and where appropriate, education programs can be designed to promote traditional crop succession practices.

Research Opportunities

A local medicinal plant garden will offer many opportunities for various types of research. The educational programs detailed above will require much more information than is currently available, especially regarding matters specific to the locale. Subjects that would be particularly benefited by research are efficacy of medicinal plants, methods of cultivation, and sustainable harvesting (Schippman et al. 2002). Additionally,

facilitating research would attract larger institutions such as universities, which would bring in additional funding and further increase opportunities at the garden and within the community.

In addition to promoting research that is applicable and necessary to education programs at the garden, research on conservation and local plant resources will also be facilitated. Information that is generally available regarding plants that are under excessive human pressure, such as CITES lists, are applicable on a global scale. Locally, different problems may exist or may be emerging, and local research is most apt for identifying these problems and identifying appropriate solutions.

Research on the efficacy of medicinal plants occurs in two different ways. The first type of research that should be conducted is survey work that seeks to understand the ways in which local people use medicinal plants. A carefully designed survey given to many members of a community will enable researchers to make generalizations about the usefulness of a plant. If many people use a plant for a particular purpose, then researchers can conclude that the plant is most likely readily available and has a reasonable degree of efficacy. Recommendations on plant use contained in educational programs should highlight these high-use plants; however, recommendations may need to be temporarily suspended if sustainability issues exist.

Secondary to compiling information on cultural uses is researching efficacy of plants through controlled studies. University involvement may be most appropriate for conducting formal efficacy research in a laboratory setting. The flow of information between the university and the local people should emphasize equity. In turn for providing university researchers with sample plant material and information on plant use, local people should be informed of information about these materials obtained during

research in a format that is locally useful. Specific agreements should be reached guaranteeing mutual benefits at the beginning of the relationship.

In order to teach local people methods of home garden cultivation, the garden must first assemble such information. The format of the research will likely be carried out similarly to the research conducted for plant efficacy. The efforts will focus on gathering information on methods from local people who do cultivate medicinal plants in home gardens and performing research to evaluate these methods and develop cultivation methods for plants that are not cultivated in home gardens. Additionally, the medicinal plant garden would serve as an excellent laboratory for evaluating the optimum cultivation methods for each plant. Off-site laboratory research would be suitable to test for variations in efficacy and secondary metabolite content based on cultivation and gathering methods (Schippman 2002).

The presence of a friendly environment between local people and the medicinal plant garden would encourage participation of academic institutions and researchers. With appropriate benefit sharing policies agreed upon, use fees paid by outsiders could be used to benefit the community, and new markets would be created to provide services for garden visitors. Numerous options for mutually beneficial relationships would exist, and benefits would focus both directly on the garden and on the local community.

Equitable Benefits

The medicinal plant garden would be in a position well suited to help provide equal benefits to members of the community across gender lines and at all levels of socioeconomic status. Equal access to information about medicinal plants would enable people who were less able to pay a specialist to better treat themselves and family

members. Cultivation programs would greatly facilitate establishment or expansion of home gardens for families of all income levels. Both use and cultivation information would decrease the likelihood that lower income families would be disadvantaged in terms of healthcare relative to their richer neighbors by providing them with a means to increase the diversity of home gardens to ultimately have access to more healthcare options (Steinberg 1998; Balick 1996). Additionally, broader access to information ensures that all members of a community will have similar access to traditional healthcare information.

For those who use the sale of medicinal plants as part of their livelihood, a centralized garden could help organize access to wider markets and reduce dependence on a middleman. Unprocessed plant materials earn far less money for villagers than the processed materials earn for a middleman; those who cultivate and gather the plant materials typically only receive a fraction of the market value of the processed herbal (Schippmann et al. 2002). By providing local people with aid on processing plant materials and expediting access to wider markets, local people who depend on medicinal plant sales for income would be advantaged.

The medicinal plant garden would contribute to the preservation of traditional knowledge and local culture. Influences of globalism have contributed to the erosion of cultural diversity throughout the world. In regard to traditional medicine, western pharmaceutical medicine is often seen as a better alternative to traditional cures. In many cultures, knowledge about traditional medicine is passed on orally within a family. If the children in the families with the most knowledge do not want to learn the traditional cures, then within the span of a lifetime a culture's knowledge of useful medicinal plants

can disappear. By compiling a culture's traditional knowledge and making education available to all, the garden would assist in the revitalization of local traditions.

The medicinal plant garden offers several important services that promise to improve local healthcare. These improvements are accomplished simultaneous to achieving conservation goals. This is particularly significant because the medicinal plant garden promotes access and responsible use; all members of a community have equal access rights to the garden, and unlike any commercialized or privileged source of healthcare, this program provides equitable benefits regardless of a user's socioeconomic status. Opportunities for families will arise such as home garden expansion, increased ability to harvest medicinal plants, more diverse family pharmacopoeia, and increased confidence in traditional medicine. Many of these benefits are not available when conservation efforts are limited to in-situ reserves.

As pharmaceuticals become available throughout the world, confidence in traditional medicine has been replaced by a desire for manufactured pharmaceuticals (Steinberg 1998). Because pharmaceuticals have limited availability in many locales, and because pharmaceuticals are often available only through cash markets, accessibility is affected by economic status. Legitimizing the use of medicinal plants by emphasizing the compatibility of traditional medicine with western medicine will increase both the value of medicinal plants and the value of the associated knowledge.

A local medicinal plant garden could offer interested companies or universities the opportunity to perform laboratory research on local medicinal plants. A benefit-sharing format should be arranged by contract to ensure that everyone involved receives appropriate benefits (Schippman et al. 2002). The garden would be an appropriate

cultural center where the details of mutual benefits agreements could be instrumented as policy, providing set guidelines for interested institutions to follow.

Information about the efficacy of medicinal plants could help demonstrate the usefulness of a traditional health care system, creating incentives for the revitalization of traditional ways and knowledge, and possibly lead to the development of a pharmaceutical. Partnerships with western institutions will demonstrate that the local culture's medicinal plant knowledge has value on a global scale.

Disadvantages of Ex-Situ Collections

The local medicinal plant garden presents several potential disadvantages that do not exist with other ex-situ collections. Any time researchers work with a group of people, the rights of the people should be respected. Yet despite the most careful efforts to explain a project to a group and obtain prior informed consent, consent may be refused or later issues of misunderstanding may arise that create hostility towards the outsiders (see Berlin and Berlin 1999).

Additionally, because all facets of a culture cannot be known and neither can human response be accurately predicted, programs instituted at the medicinal plant garden may face dilemmas and hostility at any time during the life of the garden. Issues such as upset local economies, over-exploitation of plant species, poorly conserved genetic diversity, misunderstanding or misuse of educational information, interference with traditional culture, and third party exploitation and intellectual property rights may complicate or endanger the efforts made in conjunction with the garden.

Medicinal plants are often used and sold by local people (e.g. Sundriyal and Sundriyal 2004). By encouraging all members of a society to gather and cultivate

medicinal plants, the market demand for some plants may be drastically reduced. If people depend on selling these items as a source of livelihood, the program may adversely affect them, and create hostility. Alternatively, because education will also focus on educating people on the use of medicinal plants, these markets may experience an increase in demand as people look for the plants in local markets. On the other hand, teaching people how to treat themselves with medicinal plants may lead to a decrease in demand for the services of local healers, leading to hostility. Careful study of the culture involved and involving the people who will be most affected by the creation of the garden will minimize the negative affects on local economies.

With increased knowledge of what plants to use and knowledge of how to gather these plants, there is an increased risk that people will not follow sustainability guidelines. Local in-situ reserves and forests may experience over-exploitation of certain useful species as people attempt to gather plants for their own families' use and to sell to others. Through carefully constructed education modules, based on anthropological studies of the culture, sustainability concerns can be most effectively taught to the people in the culture.

Local garden planners will have to select a limited spectrum of a species' natural genetic diversity. Numerous cultivars and selections may be included, but the collection will not likely be able to contain all traits available in the wild. However, programs that teach sustainable methods of transferring wild plants to home gardens will improve the total genetic diversity of the local collections, and a trading network would make recently collected traits available to other gardens.

Information that is obtained through surveys and interviews with local practitioners regarding medicinal plant use will always vary in accuracy. Providing usage information

to people could result in dangerous situations. People might use plants incorrectly; people might use plant medicines instead of alternate options that could prove more effective; plant medicines may have harmful interactions with other medicines being taken. All of these scenarios can never be prevented, and only through careful research and warnings coupled with a well-designed education program can these dangerous situations be minimized.

In addition to possibly negatively affecting markets for traditional healers, by changing the flow of knowledge within a culture, the programs would be strongly affecting that culture. Despite efforts to explain all implications of the project to the local people involved with medicinal plants and efforts to obtain prior informed consent, power shifts may occur or be perceived and alienate local healers or others affected by the programs at the garden. Researchers should evaluate the potential changes that might occur, and they must consider whether providing certain educational services will provide sufficient benefits to the local people to justify potential changes that may occur within the culture and society of the people affected.

Because markets for medicinal plant products are growing in many countries, compiling information about medicinal plants creates the risk of facilitating commercial exploitation. If a market becomes available for a medicinal plant known to the world because of the knowledge of a traditional culture, cultivating the plant on a large scale for commercial profits may become a realistic option. However, large companies will be the best equipped to cultivate plants on a large scale due to financial backing that will be unavailable to most groups. Such exploitation of the knowledge obtained through a medicinal plant garden denies the local group's intellectual property rights relative to the medicinal plant. Safeguarding against this type of exploitation is difficult and will vary

amongst nations. It is more likely, however, that carefully recording the knowledge of a culture, and documenting the sources will provide more evidence of a culture's knowledge and discoveries than the relative silence that may otherwise exist. Careful planning and presentation of the information obtained tailored to a nation's intellectual property rights policies will maximize the likelihood of protecting the culture's rights to the benefits of their knowledge (for a discussion of bioprospecting, see Dhillion et al. 2002).

Two Ex-Situ Conservation Programs

The University of Georgia Latin American Ethnobotanical Garden

The University of Georgia hosts an ethnobotanical garden called The Latin American Ethnobotanical Garden. The garden project was started by Dr. Brent Berlin in conjunction with other UGA faculty and students in 1995 as part of the University of Georgia's Center for Latin American and Caribbean Studies (CLACS) (Interview with Paul Duncan). The garden is located in an easily accessible part of the Universities main campus in Athens, Georgia.

The Garden's mission is described as follows:

"The purpose of the Latin American Ethnobotanical Garden is to highlight the plants of cultural significance in Latin America and focus attention on the critical need for conservation of this biodiversity. The project emphasizes the study of ethnobotany through a variety of related disciplines such as anthropology, botany, horticulture, ecology, pharmacology, biochemistry and conservation biology (http://www.uga.edu/ethnobot/Abt.html)."

From the mission statement, it is evident that the primary audience consists of the faculty and students at the University of Georgia. The garden occupies approximately one half acre located adjacent to the building that houses the University's Sociology and Anthropology departments. In addition to classes and researchers visiting the garden, numerous people pass through the garden as they access one of the University's parking lots, connected to the garden by a bridge. The garden also has several benches and tables for visitors.

The garden's secondary audience consists of people visiting the garden as part of outreach programs to local schools and Latin American communities. The garden is available for educational opportunities at all levels and for Latin American cultural events.

As an ex-situ plant collection, the garden emphasizes the need for conservation of medicinal plants while stressing the significance of medicinal plants for people in Latin America. To accomplish its mission, the garden is available to faculty and students for research and projects, has partnered with other gardens throughout the Americas, set up local education programs, and provided visitors with plant identification plaques. As a non-local garden the focus and outreach programs are somewhat different than local medicinal plant gardens.

The garden is available to students and faculty for a variety of academic projects. The garden is available as an outdoor, interactive classroom. Recently, graduate students in a graduate landscape architecture course taught at the University of Georgia by Professor Brian LaHaie, created landscaping designs for the garden to accent the garden's ties to Latin American culture. Other graduate students and undergraduate students are performing research tied to the garden, and many opportunities are available.

The garden has partnerships with several other 'sister' gardens throughout Central and South America. The purpose of the partnerships is similar to other garden networks, such as the specimen and information sharing between the proposed medicinal plant gardens detailed above as well as the Ayurvedic medicinal plant garden networks detailed below. Cultivation materials and research can be exchanged between the sister gardens. The university garden partnership differs from the other garden partnerships in that from the beginning, programs were intended to allow for the exchange of students and faculty between gardens, a focus primarily on the academic audience (http://www.uga.edu/ethnobot/Sis.html).

In addition to providing an educational resource for undergraduate and graduate education, the Latin American Ethnobotanical Garden also promotes education of local residents at all socioeconomic and educational levels. The University of Georgia's Center for Latin American Studies is initiating a program that will ultimately establish ethnobotanical gardens in all elementary schools in the same county as the University of Georgia, Athens-Clarke County. Currently the program is in the pilot stage, with the first elementary school garden currently under construction. The program will include training for teachers to include the garden in the regular curriculum.

Because the garden is accessible at all times, anybody is able to peruse the informational plaques throughout the garden, independent of structured programs (http://www.uga.edu/ethnobot/Edu.html). Additionally, Latin American cultural events are scheduled periodically at the garden. Future plans for additional development of the garden include the installation of a recently donated twenty-seven foot long greenhouse Also, additional landscape features modeled after traditional Latin American architecture

will be implemented to increase the aesthetics of the garden and provide more connections to Latin American culture.

The partnership with numerous other gardens encourages the development of the gardens. The San Luis Valley medicinal plant garden and any ethnobotanical garden would likely benefit from similar partnerships. Many cultures throughout the American tropics use closely related plants as medicine. Efficacy research and cultivation methods for these plants could be shared amongst the partnered gardens, benefiting all involved. Partnership with a university will tend to bring in additional money and technology to support the garden, as well as providing convenient channels to researchers.

Foundation for Revitalization of Local Health Traditions

The Foundation for Revitalisation of Local Health Traditions (FRLHT) is a state sponsored effort to preserve medicinal plants and Ayurvedic traditions in India. The program consists of both in-situ and ex-situ conservation efforts. Conservation is combined with numerous outreach programs to protect in-situ reserves for their genetic and evolutionary potential, create ex-situ reserves for research and use, and education and advocacy for traditional Ayurvedic plant use. The program uses both in-situ and ex-situ conservation to further outreach and to involve members of local communities.

The cultural revitalization goals of the FRLHT focus on teaching community members how to use traditional Ayurvedic and aboriginal medicine in their lives. The Ayurvedic tradition refers to the long-standing, codified health tradition in India. The FRLHT seeks to promote both this system and the related aboriginal system of uncodified healthcare and medicinal plant usage. Goals focus on preserving the vitality of both aspects of the tradition and continuing the active development of the aboriginal

system (http://www.frlht-india.org/html/tsm.htm). These goals specifically target local communities, whose participation is vital to the program's success.

The in-situ conservation program consists of fifty-five distributed reserves or "Medicinal Plant Conservation Areas", which are distributed across five states. These reserves contain fifty percent of the recognized local medicinal plant species and seventy-five percent of the listed marginalized species. The program is designed to encourage the local communities to help protect and manage the conservation areas. Additionally, there are twelve degraded forest areas, which have restoration programs. Local communities are involved in planting, maintenance, and harvesting of medicinal plants endemic to the areas (http://www.frlht-india.org/html/consact.htm).

The conservation programs offered through the ex-situ conserves consist of the following parts: medicinal plant gardens, outreach nursery, and an income generation program. The local tradition revitalization program consists of two parts, the documentation and examination of local health traditions and the home garden promotion program. Together these programs offer a well-rounded effort to both promote conservation goals and cultural revitalization goals.

There are eighteen community medicinal plant gardens managed by NGOs. These gardens each consist of around 250 species of medicinal plants with limited populations capable of fulfilling propagation, research, and educational needs. Alltogether the medicinal plant gardens contain over 894 medicinal plant species. The overlap between gardens helps meet the material requirements of the various programs offered (http://www.frlht-india.org/html/es.htm). The audience of the gardens and associated education programs are the following "farmers, schools, colleges, folk healers and self help woman groups" (http://www.frlht-india.org/html/consact.htm).

The outreach nurseries are used to supply local communities with key medicinal plant species for cultivation. The primary task is to raise seedlings for distribution. Seedlings are also provided to local community herbal gardens and local education institutions (http://www.frlht-india.org/html/consact.htm).

Of particular interest is the income generation program. The income generation program is designed to give farmers the opportunity to cultivate medicinal plants for their own economic benefit. In the middle of 2003, Mr. G Raju, the director of the NGO, Grama Mooligai Company Limited, responsible for the income generation program, noted that market volatility complicated the efforts of farmers to market medicinal plants that had been cultivated. Accordingly Grama Mooligai Company Limited and a pharmaceutical company made plans to buy back cultivated medicinal plants from farmers in the program (http://www.gandeepam.org/ngos.php).

In addition to conservation efforts, the FRLHT is conducting conservation education programs, cultivation research, sustainable harvest research, and documentation of traditional knowledge. The conservation education program targets "students, tourists, pilgrims and the general public (http://www.frlht-india.org/html/consact.htm)." The program seeks to create awareness in the audience about conservation issues and medicinal plant diversity. Demonstration gardens, nature trails, and interpretational materials have been developed at several of the Medicinal Plant Conservation Areas to enhance the effectiveness of this program. Cultivation research programs focus on development of propagation techniques for five highly traded medicinal plant species. Sustainable harvest research seeks to develop a methodology for sustainable harvest to empower local communities to manage local resources. The documentation of traditional knowledge seeks to codify and understand community

medicinal plant knowledge. This knowledge will be essential in developing programs that are specifically tailored to the local communities. These programs assemble, discover, and redistribute information that has the potential to enhance the effectiveness of both in-situ and ex-situ conservation efforts, targeting multiple audiences to ensure a wide awareness of the issues involved.

The FLRHT as a Model

The programs instituted by the Foundation for Revitalisation of Local Health Traditions can be used to analyze possibilities for other gardens. Because the main portion of the efforts occurs in five states, the extent of the resources is quite large. Also, the Ayurvedic tradition encompasses far more people than most traditional systems will. Accordingly, the extent of the system will likely be much greater. As a model for the San Luis Valley medicinal plant garden, the FRLHT demonstrates several carefully considered policies.

A combined ex-situ and in-situ conservation strategy offers advantages over a strategy including only in-situ conservation. The involvement of local communities with the program to integrate community with conservation maximizes the benefits and minimizes the disadvantages inherent to unintegrated programs. Like the FRLHT, the garden in San Luis should attempt to broaden the variety of locally cultivated varieties of medicinal plants and increase accessibility by promoting a network of multiple gardens. Because the San Luis valley is relatively small, home gardens should be incorporated into the genetic structure of the main garden by promoting an attitude of mutual benefits through inter-garden plant material trading. Also, like the FRLHT, establishing an outreach nursery program to encourage the growth of home gardens will encourage

community involvement and benefit the participants. The FRLHT nursery sells cuttings and cultivation materials. In the San Luis Valley other options may be more successful; and a study of the area will be necessary to determine the best method of distributing cultivation materials.

Compiling traditional usage information to develop an understanding of the local ethnoecology is a more urgent goal for the San Luis Valley garden, because unlike the Ayurvedic tradition, a strong history of codification does not exist. Additionally, developing educational methods for teaching local traditions will require careful examination of the data available and the local culture.

The FRLHT's programs that allow college students to conduct course work through hands on experience in the garden serves as a demonstration of the possibilities that are available for local and extended education (http://www.frlht-india.org/html/es.htm). Again, it is important for the San Luis Valley that mutual benefit possibilities be carefully examined prior to engaging in programs with universities and other outside organizations to ensure equitability.

Conclusion

In locales where cultural and species diversity are experiencing a decline, optimum conservation results will be obtained when in-situ and ex-situ conservation measures are combined. Solutions that focus on protective reserves may deny local peoples the ability to use important resources, and thus negatively affect both the people and the traditions of their culture. In areas where people rely on medicinal plants for their healthcare, instituting a medicinal plant garden as described above has the potential to achieve sustainable in-situ forest reserves, revitalize local traditions, provide equitable healthcare

options throughout a society, and provide enhanced education options to local people and visitors. Careful ethnology will be necessary to ensure that well-intentioned programs do not become harmful because of ignorance. Ultimately, an integrated system as described above can account for concerns about individual and cultural autonomy, and contribute to the achievement of global conservation goals.

CHAPTER 2

MEDICINAL PLANT USE IN THE SAN LUIS VALLEY

The San Luis valley is located at the base of the Monteverde Cloud Forest Reserve, northeast of the Gulf of Nicoya, on the Pacific side of Costa Rica. In the San Luis valley, the University of Georgia manages the Ecolodge and Research Station San Luis, which hosts various academic programs, and provides services for ecotourists. The facilities at the ecolodge include a botanical garden with a medicinal plant garden. The collection in the medicinal plant garden highlights locally grown and used medicinal plants.

In addition to serving as an academic tool for researchers and students and because members of the San Luis Valley community continue to actively use medicinal plants, the medicinal plant garden has the opportunity to facilitate outreach programs to serve the local community. To best serve the community and enhance efforts toward local biological and cultural conservation, the medicinal plant garden should feature content and interpretive materials specific to the practices of the San Luis valley community members. Through the gathering and analysis of information on local and regional medicinal plants, conservationists and researchers at Ecolodge and Research Station San Luis will be able to develop programs at the garden suitable to the needs of the local community.

My research has accordingly focused on compiling medicinal plant data that is relevant to medicinal plant usage in the San Luis valley. In addition to including ethnobotanical data directly related to the San Luis valley community, I include data from surrounding areas to facilitate cross-cultural comparisons. The database includes data on

local medicinal plant use, Costa Rican medicinal plant use, and Neotropical medicinal plant use.

Purpose

The primary purpose of my research is to evaluate the collection of medicinal plants in the medicinal plant garden at the Ecolodge and Research Station San Luis to determine the extent to which the medicinal plants in the collection constitute a representative sample of the medicinal plants used by the community in the San Luis valley. Because I was unable to locate any formal ethnobotanical studies that specifically focused on the San Luis valley, I use the data available to artificially predict what might be the most important San Luis valley medicinal plants.

To accomplish this goal, I compiled a database of available medicinal plant usage data for the San Luis valley. To allow further comparisons and observations about medicinal plant use in the San Luis valley, I included data on general Costa Rican medicinal plant use and Neotropical medicinal plant use. The medicinal plant database is in Microsoft Access format, allowing continuous updates as new information sources become available. Data entries are organized primarily by genus and species names, and include data about each species (when available) as follows: family name, common name, Costa Rican uses, other uses, origin, and distribution.

Methodology

To allow for an evaluation of San Luis valley medicinal plant usage and to provide a basis for comparisons, I condensed the data in the database into a shortened list or *cuadro basico*, which contains a hypothesized list of the most important medicinal plant

species for the San Luis valley community. The development of a *cuadro basico* provides a basis for an evaluation of the collection of medicinal plants in the medicinal plant garden. Species that are listed in the *cuadro basico*, but are not part of the collection should be considered as candidates for inclusion in the medicinal plant collection.

The sources I used to compile the database consist of primarily sources discussing medicinal plant use in the San Luis valley and the rest of Costa Rica. With the help of Dr. Jim Affolter I obtained several lists of San Luis valley medicinal plants from the faculty and staff of Ecolodge and Research Station San Luis. I entered each of these sources into the database as distinct sources; however, it is likely that these lists are revisions of a list originally compiled by Diana and Milton Lieberman as a list of commonly used medicinal plants based on their experience in the San Luis valley. Accordingly, these lists are considered as one source in predicting the San Luis valley *cuadro basico*.

I also obtained from Dr. Jim Affolter a summary of survey work completed by University of Georgia undergraduate students detailing the medicinal plants used by host families in the San Luis valley. In 2003 and 2004, participating San Luis valley families housed students for a short duration, and during the stay, each student interviewed his/her host family for information on their medicinal plant usage.

To expand the database further, I included information from several sources discussing Neotropical cultures. The sources from outside Costa Rica focus on Belize (Arvigo and Balick 1993), Puerto Rico (Melendez 1982), and the Amazon region (Duke and Vasquez 1994). The inclusion of these sources allows further predictions to be made about San Luis valley medicinal plant usage.

The *Cuadro Basico*

At the time I began to delimit the contents of the *cuadro basico*, the database contained 1050 entries for 333 medicinal plant species from thirteen sources (see Appendix A). Because my research does not include a complete ethnobotanical study of the members of the San Luis community, the criteria I chose for including species in the *cuadro basico* were based on the assumption that the most important medicinal plants will tend to also be the most frequently mentioned in related literature.

Because the *cuadro basico* is intended to reflect San Luis valley medicinal plant use, I first reduced the list of plant species to only plants that were referenced by a source dealing with the San Luis valley. This criterion reduced the list of species from 333 to 120. To further refine the list of included species I removed from the list any species that were not mentioned by at least two Neotropical sources, considering the multiple revised lists from the Lieberman's list as one source. This final criterion further reduced the list to 93 species.

Next, I presented this list to two Costa Rican medicinal plant experts, Jorge Arce Portuguez, Professor at EARTH University in Costa Rica, and Hernán Rodríguez Navas, Costa Rican medicinal plant expert and author, who cooperatively reviewed the list and suggested that two species be removed. They also suggested the addition of several other species. I then revised the *cuadro basico* to reflect their recommendations.

Two plants were described as uncommon and their removal from the *cuadro basico* was recommended. *Dicliptera unguiculata* is not often used as a medicinal plant in Costa Rica, but its use is more common in Nicaragua. *Elettaria cardamomum* is not commonly used in Costa Rica.

Five species were recommended as additions to the *cuadro basico* that were in the database but initially removed from consideration for the *cuadro basico* because they did not meet the criteria of being listed by the San Luis valley sources. These species are as follows: *Bougainvillea spp*., *Polypodium spp*., *Citrus aurantium*, *Erythrina sp*., and *Piper spp*.

Three species were recommended as additions to the *cuadro basico*, which were not part of the database. These species are as follows: *Tagetes erecta, Ilex paraguariensis,* and *Erythrina lanceolata.*

The final list of species in the proposed San Luis valley *cuadro basico* contains 99 species (see Appendix B). All of these species have been either identified as being used in the San Luis valley or recommended as an essential medicinal plant species by experts.

Discussion

Throughout this study the focus on San Luis valley medicinal plants has been limited by the availability of ethnobotanical data specific to the San Luis valley community. My method of creating a *cuadro basico* relies on several assumptions and the use of limited data. Only two certainly distinct sources of San Luis valley ethnobotanical information are available, and neither of these sources is published in a peer reviewed academic journal, thus the extent to which the data provided by these sources accurately reflects the medicinal plant usage in the San Luis valley is uncertain. The method I employed to predict the contents of the *cuadro basico* is thus necessarily artificial.

By first limiting the list to species referenced by the sources documenting San Luis valley medicinal plant usage, I assume that the most important plants used locally are the most conspicuously used and therefore are part of at least one of the San Luis valley lists.

In the second step of delimiting the *cuadro basico,* Twenty-seven species are referenced in the remaining San Luis valley lists (those lists other than the 2003/2004 survey) that are removed from the list of species in the *cuadro basico*. These species are not part of the final *cuadro basico* because they were not referenced by any of the other sources that I used. Because, the criteria I chose to delimit the most important medicinal species were necessarily artificial, the exclusion of a species is contingent on the accuracy of my assumptions in delimiting the species list. The included species are more conspicuous as medicinal plants, demonstrated by the additional sources that reference these species. My assumption in the second step is that because these species either have a greater degree of efficacy or are more readily available, they are thus more likely to be a part of a culture's pharmacopoeia.

However, because the list of plants compiled by Diana and Milton Lieberman contains only species that they cultivated in the San Luis valley, species on this list will tend to be those that are most easily cultivated. Whether the Lieberman's list reflects the medicinal plant usage of the San Luis valley community will be dependent on the accuracy of a list of plants that necessarily limits those species that are not easily cultivated. On the other hand, the data from the 2003/2004 homestay survey will be accurate to the extent that the medicinal plant usage of the families interviewed constitutes a representative sample of the medicinal plant usage of the San Luis valley community.

The current contents of the medicinal plant garden in the San Luis valley consist of seventy-two medicinal plant species. Fifty-nine (82%) of these species also appear on the *cuadro basico* (see Appendix C); alternatively, fifty-nine (59%) of the species in the *cuadro basico* are also in the medicinal plant garden. Thirty-seven species in the proposed *cuadro basico* are not in the medicinal plant garden, and the inclusion of these species in the garden should be considered, as they have all been referenced by at least one source related to the San Luis valley and one additional Neotropical source. The thirteen (18%) species in the medicinal plant garden that are not on the *cuadro basico* should be reevaluated, as they may either be important additions to the *cuadro basico* or they may not be a significant part of the local pharmacopoeia.

Conclusion

The criteria I chose to delimit the *cuadro basico* assume that the medicinal plants used in the San Luis valley are only important if the use of the species has been documented in the sources included in this analysis. Because this analysis is lacking in a thorough ethnobotanical study, the artificial selection of species for the *cuadro basico* is meant only as a proposed list of plants that are likely to be important in the San Luis valley pharmacopoeia. Species that are not listed may also be important, while species listed in the *cuadro basico* may actually be rarely used in the San Luis valley.

Future evaluations of the contents of the medicinal plant garden and considerations of a San Luis valley *cuadro basico* will require careful quantitative ethnobotanical studies of the San Luis valley community. Ethnobotanical studies of Neotropical cultures have resulted in the development and refinement of several methods to scientifically measure the role of a species in a culture's pharmacopoeia.

Concepts such as the homogeneity of a culture's use of a plant species can be quantitatively assessed with techniques such as those used by Trotter and Logan (1986, cited in Amiguet et al. 2005) and readapted by Heinrich (2000, cited in Amiguet et al. 2005) and Amiguet et al. (2005). Attention to homogeneity will inform the applicability of a small scale, non-random survey such as the 2004 San Luis valley survey as well as contribute to an understanding of the role of medicinal plants in the community.

Other authors have proposed various models for surveying communities for ethnobotanical data focusing on a thorough and quantitative assessment of medicinal plant usage. Phillips et al. (1993) propose a system that quantitatively measures the "use value" of a species. Their system focuses on quantifying use value information provided by an informant, rather than the value judgment of a species made by the informant. This method parallels consensus methods (see Trotter and Logan 1986, cited in Phillips et al. 1993), but the informant's subjective valuation of the plant is replaced by the number of uses for a plant mentioned during an interview. This method is similar to the method employed by myself in this study, as my method quantitatively ranks the plants by the frequency of references in a way similar to Phillips et al. (1993) field study.

Interviews with individuals or groups can be conducted for sample identification and usage group classification (see Gemedo-Dalle 2005). For a thorough review of ethnobotanical techniques and the cultural and ecological implications, see Cunningham (2001).

Works Cited

Altieri M.A. and Merrick L.C. 1987. In situ conservation of crop genetic resources through maintenance of traditional farming systems. Economic Botany 4: 86-96.

Amiguet V.T., Arnason J.T., Maquin P., Cal V., Vindas P.S. and Poveda L. 2005. A Consensus Ethnobotany of the Q'eqchi' Maya of Southern Belize. Economic Botany 59: 29–42.

Arvigo R. and Balick M. 1993. Rainforest Remedies: one hundred healing herbs of Belize. Lotus Press, Twin Lakes, WI.

Ashton P.S. 1987. Biological Considerations in in situ vs ex situ Plant Conservation. Botanic Gardens and the World Conservation Strategy, Academic Press Inc, London, pp. 117-130.

Balick M.J. 1996. Transforming Ethnobotany for the New Millenium. Annals of the Missouri Botanical Garden 83: 58-66.

Berlin B. and Berlin E.A. 1999. Knowledge? Whose Property? Whose Benefits? The case of OMIECH, RAFI, and the Maya ICBG. guallart.dac.uga.edu/ICBGreply.html

Berlin B. and Berlin E.A. 2003. NGOs and the process of prior informed consent in bioprospecting research: the Maya ICBG project in Chiapas, Mexico. International Social Science Journal 55: 629.

Botanic Gardens Conservation International. accessed 15 April 2005. Botanic Gardens: Conservation, Leisure, Education. www.bgci.org.uk/botanic_gardens/index.html.

Chazdon R.L. and Coe F.G. 1999. Ethnobotany of Woody Species in Second-Growth, Old-Growth, and Selectively Logged Forests of Northeastern Costa Rica. Conservation Biology 13: 1312-1322.

Cunningham A.B. 2001. Applied Ethnobotany. People, Wild Plant Use & Conservation. Earthscan. London, United Kingdom.

Dhillion S.S., Svarstad H., Amundsen C. and Bugge H.C. 2002. Bioprospecting: Effects on Environment and Development. AMBIO: A Journal of the Human Environment 31: 491–493.

Duke J.A. and Martinez R.V. 1994. Amazonian Ethnobotanical Dictionary. CRC Press, Boca Raton, FL.

Fairhead J. and Leach M. 1996. Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic. Cambridge University Press, Cambridge, UK.

Gemedo-Dalle T., Maass B.L. And Isselstein J. 2005. Plant Biodiversity and Ethnobotany of Borana Pastoralists in Southern Oromia, Ethiopia. Economic Botany 59: 43–65.

Grimes A.B, Jahnige P., Loomis S., Burnham M., Onthank K., Palacios W., Ceron C., Neill D., Balick M. and Mendelsohn R. 1994. The Value of Tropical Forests: A study of nontimber forest products in the primary forest of the upper Napo Province, Ecuador. Ambio 32: 405-410.

Hamilton A.C. 2004. Medicinal Plants, Conservation and Livelihoods. Biodiversity and Conservation 13: 1477-1517.

Hawkes J.G., Maxted N. and Ford-Lloyd B.V. 2001. The Ex situ Conservation of Plant Genetic Resources. Kluwer Academic Publishers, London.

Heinrich M. 2000. Ethnobotany and its role in drug development. Phytotherapy Research 14: 479–488.

Heywood V.H. 1987. The Changing Role of the Botanic Garden. Botanic Gardens and the World Conservation Strategy. Academic Press Inc, London.

Instituto Nacional de Biodiversidad. 2004. Especies de Costa Rica. http://www.inbio.ac.cr/.

Martinez-Rodriguez, Maria Ruth. 2001. Plantas Medicinales del Jardín de EARTH. EARTH University, Costa Rica.

Marjokorpi A. and Ruikolainen K. 2003. The role of traditional forest gardens in the conservation of tree species in West Kalimantan, Indonesia. Biodiversity and Conservation 12: 799–822.

Maunder M., Higgens S. and Culham A. 2001. The Effectiveness of Botanic Garden Collections in Supporting Plant Conservation: a European case study. Biodiversity and Conservation 10: 383-401.

Meilleur B.A. 1991. The Ethnobotanical Garden and Tropical Plant Conservation. In: Heywood P.S. and Jackson W. (eds) Tropical Botanic Gardens: Their role in Conservation and Devleopment. Academic Press ltd, London, pp. 79-88.

Melendez E.N. 1982. Plantas Medicinales de Puerto Rico: Folklore y Fundamentos Científicos. La Universidad de Puerto Rico, Río Piedras, Puerto Rico.

Mendelsohn R. and Balick M. 1995. Private Property and Rainforest Conservation. Conservation Biology 9: 1322-1323.

Nabhan G.P. 1995. The Dangers of Reductionism in Biodiversity Conservation. Conservation Biology 9: 479-481.

Navas H.R. 2000. La utilidad de las plantas medicinales en Costa Rica. Primera edición, segunda reimpresión. Editorial Universidad Nacional, Heredia, Campus Omar Dengo, Costa Rica

Ocampo R. and Maffioli A. 1987. El Uso de Algunas Plantas Medicinales en Costa Rica. Volumen No. 1, Segunda Edicion. LIL, San José, Costa Rica.

Pei S. 2001. Ethnobotanical Approaches of Traditional Medicine Studies: Some Experiences from Asia. Pharmaceutical Botany 39: 74–79.

Peters C.M., Gentry A.H. and Mendelsohn R. 1989. Valuation of an Amazonian Rainforest. Nature 339: 655-656.

Phillips O, Gentry A.H., Reynel C., Wilkin P. and Gálvez-Durand B. 1993. Quantitative Ethnobotany and Amazonian Conservation. Conservation Biology 8: 225-248.

Pinedo-Vasquez M., Zarin D., Jipp P. and Chota-Inuma J. 1990. Use-Values of Tree Species in a Communal Forest Reserve in Northeast Peru. Conservation Biology 4: 405-416.

Raven P.H. 1987. The Scope of the Plant Conservation Problem World-Wide. Botanic Gardens and the World Conservation Strategy, Academic Press Inc, London, pp. 19-30.

Salafsky N., Dugelby B.L. and Terborgh J.W. 1993. Can Extractive Reserves Save the Rain Forest? An Ecological and Socioeconomic Comparison of Nontimber Forest Product Extraction Systems in Petén, Guatemala, and West Kalimantan, Indonesia. Conservation Biology 7: 39-52.

Salafsky N. 1994. Forest gardens in the Gunung Palung region of West Kalimantan, Indonesia. Agroforestry Systems 28: 237-268.

Sarkis A. and Campos V. 1985. Curanderismo Tradicional Del Costarricense: Curaciones con Plantas Medicinales y remedies caseros. Lehmann Editores, San José, Costa Rica.

Schippmann U., Leaman D.J. and Cunningham A.B. 2002. Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity: Global Trends and Issues. InterDepartment Working Group on Biology Diversity for Food and Agriculture, FAO, Rome, Italy.

Sheldon J., Balick M. and Laird S. 1997. Medicinal Plants: Can Utilization and Conservation Coexist? The New York Botanical Garden.

Steinberg M.K. 1998. Neotropical Kitchen Gardens as a Potential Research Landscape for Conservation Biologists. Conservation Biology 12: 1150-1152.

Stepp J.R. and Moerman D.E. 2001. The Importnace of Weeds in Ethnopharmacology. Journal of Ethnopharmacology 75: 19-23.

Sundriyal M. and Sundriyal R.C. 2004. Wild Edible Plants of the Sikkim Himalaya: Marketing, Value Addition and Implications for Management. Economic Botany 58: 300–315.

Trotter R.T. and Logan M.H. 1986. Informant consensus: A new approach for identifying potentially effective medicinal plants. In: Etkin N.L. (ed) Plants in Indigenous Medicine and Diet. Redgrave Publishing Company, Bedford Hill, New York, pp. 91–112.

The following local lists were provided by the faculty and staff of the Ecolodge San Luis and Research Station.

Jardin de plantas Medicinales: list of plants in the garden as of fall 2003. obtained from University of Georgia student Dana Camp.

Jardin Dominga. September 2004. obtained from Dr. Jim Affolter.

Lieberman. list of plants cultivated in San Luis valley by Milton and Diana Lieberman. September 2004. obtained from Milton and Diana Lieberman.

San Luis Valley Survey 2003 and 2004: San Luis valley homestay survey results. obtained from Dr. Jim Affolter.

UGA San Luis Valley medicinal plant garden. garden contents as of spring 2005. obtained from Dr. Jim Affolter.

Appendix A
Medicinal Plant Species List

Species Genus Name	Family Name
Acacia spadicigera	Fabaceae
Acnistus arborescens	Solanaceae
Agave angustifolia	Agavaceae
Ageratum conisoides	Asteraceae
Agropyron sps.	Poaceae
Allium cepa	Liliaceae
Allium sativum	Liliaceae
Aloe barbadensis	Liliaceae
Aloe vera	Liliaceae
Aloysia triphylla	Verbenaceae
Amaranthus dubius	Amaranthaceae
Amaranthus sp	Amaranthaceae
Amaranthus spinosus	Amaranthaceae
Amaranthus viridis	Amaranthaceae
Ambrosia cumanensis	Asteraceae
Anacardium excelsum	Anacardiaceae
Anacardium occidentale	Anacardiaceae
Anethum graveolens	Apiaceae
Annona cherimola	Annonaceae
Annona muricata	Annonaceae
Annona reticulata	Annonaceae
Annona sp	Annonaceae
Apium graveolens	Apiaceae
Argemone mexicana	Papaveraceae
Arracacia xanthorrhiza	Apiaceae
Artemisia absinthium	Asteraceae
Artocarpus communis	Moraceae
Asclepias curassavica	Asclepidiaceae
Attalea butyracea	Arecaceae
Barosma betulina	Rutaceae
Bidens pilosa	Asteraceae
Bixa orellana	Bixaceae
Borago officinalis	Boraginaceae
Bocconia frutescens	Papaveraceae
Bougainvillea spp.	Nyctaginaceae
Bromelia pinguin	Bromeliaceae
Brugmansia candida	Solanaceae
Brugmansia suaveolens	Solanaceae
Bryophyllum pinnatum	Crassulaceae
Buddleja americana	Loganiaceae
Bursera simaruba	Burseraceae
Byrosnia crassifolia	Malpighiaceae
Caesalpinia pulcherrima	Fabaceae

Calendula officinalis	Asteraceae
Calophyllum brasiliense	Clusiaceae
Canavalia ensiformis	Fabaceae
Cannabis indicus	Cannabaceae
Cannabis sativa	Cannabaceae
Capsicum annuum	Solanaceae
Capsicum frutescens	Solanaceae
Carica papaya	Caricaceae
Carica pubescens	Caricaceae
Casimiroa sapota	Rutaceae
Cassia fistula	Fabaceae
Cassia grandis	Fabaceae
Cassia hispidula	Fabaceae
Cassia occidentalis	Fabaceae
Cassia reticulata	Fabaceae
Cassia sp	Fabaceae
Catharanthus roseus	Apocynaceae
Cecropia insignis	Cecropiaceae
Cecropia obtusifolia	Cecropiaceae
Cecropia peltata	Cecropiaceae
Cecropia sp	Cecropiaceae
Cestrum lanatum	Solanaceae
Chamaesace hyssopifolia	Euphorbiaceae
Chamaesyce hirta	Euphorbiaceae
Chaptalia nutans	Asteraceae
Chenopodium ambrosioides	Chenopodiaceae
Chrysanthemum parthenium	Asteraceae
Cichorium intybus	Asteraceae
Cinchona pubescens	Rubiaceae
Cinnamomum verum	Lauraceae
Cissus sicyoides	Vitaceae
Citrullus vulgaris	Cucurbitaceae
Citrus aurantifolia	Rutaceae
Citrus aurantium	Rutaceae
Citrus limetta	Rutaceae
citrus medica	Rutaceae
Citrus sinensis	Rutaceae
Citrus sp	Rutaceae
Clematis dioica sp	Ranunculaceae
Cnidoscolus aconitifolius	Euphorbiaceae
Cochlospermum vitifolium	Bixaceae, also placed in Cochlospermaceae
Cocos nucifera	Arecaceae
Coffea arabica	Rubiaceae
Coffea sp	Rubiaceae
Coriandrum sativum	Apiaceae
Costus spicatus	Costaceae, also placed in Zingiberaceae
Cresecentia cujete	Bignoniaceae
Croton draco	Euphorbiaceae
Croton niveus	Euphorbiaceae
Cucurbita moschata	Cucurbitaceae
Cupressus sp	Cupressaceae

Curcuma domestica	Zingiberaceae
Curcuma longa	Zingiberaceae
Cymbopogon citratus	Poaceae
Cymbopogon nardus	Poaceae
Datura arborea	Solanaceae
Datura stramonium	Solanaceae
Delphinium ajacis	Ranunculaceae
Dicliptera unguiculata	Acanthaceae
Dieffenbachia oerstedii	Araceae
Dioscorea alata	Dioscoreaceae
Dioscorea belizensis	Dioscoreaceae
Diphysa americana	Fabaceae
Echinacea angustifolia	Asteraceae
Echinacea purpurea	Asteraceae
Elettaria cardamomum	Zingiberaceae
Emilia sonchifolia	Asteraceae
Equisetum bogotense	Equisetaceae
Eryngium corlinae	Apiaceae
Eryngium foetidium	Apiaceae
Eryngium maritmum	Apiaceae
Erythrina fusca	Fabaceae
Erythrina poeppigiana	Fabaceae
Erythrina sp	Fabaceae
Eucalyptus cinerea	Myrtaceae
Eucalyptus globulus	Myrtaceae
Eugenia stipitata	Myrtaceae
Euphorbia lancifolia	Euphorbiaceae
Euphorbia sp	Euphorbiaceae
Ficus carica	Moraceae
Ficus citrifolia	Moraceae
Ficus cotinifolia	Moraceae
Ficus insipida	Moraceae
Ficus jimenezii	Moraceae
Ficus maxima	Moraceae
Ficus nymphaeifolia	Moraceae
Ficus sp.	Moraceae
Fragaria vesca	Rosaceae
Furcraea cabuya	Agavaceae
Genipa americana	Rubiaceae
Gliricidia sepium	Fabaceae
Gossypium hirsutum	Malvaceae
Guazuma ulmifolia	Sterculiaceae
Hamelia patens	Rubiaceae
Hedeoma aff pulegioides	Labiatae
Hibiscus rosa-sinensis	Malvaceae
Hibiscus sabdariffa	Malvaceae
Hyptis suaveolens	Lamiaceae
Hypericum perforatum	Clusiaceae
Illicium verum	Illiciaceae
Inga edulis	Fabaceae
Jacobinia tinctoria	Acanthaceae

Jatropha aconitifolia	Euphorbiaceae
Jatropha gossypiifolia	Euphorbiaceae
Justicia pectoralis	Acanthaceae
Justicia tinctoria	Acanthaceae
Kalanchoe pinnata	Crassulaceae
Lactuca sativa	Asteraceae
Laguncularia racemosa	Combretaceae
Lantana camara	Verbenaceae
Lavandula angustifolia	Lamiaceae
Legume (gungu-peas)	Fabaceae
Leontodon taraxacum	Asteraceae
Leonurus sibricus	Lamiaceae
Linum usitatissimum	Linaceae
Lippia alba	Verbenaceae
Lippia dulcis	Verbenaceae
Lippia graveolens	Verbenaceae
Lippia origanoide	Verbenaceae
Ludwigia octovalvis	Onagraceae
Lycopersicon esculentum	Solanaceae
Magnolia grandiflora	Magnoliaceae
Malachra alceifolia	Malvaceae
Malva parviflora	Malvaceae
Malva sp	Malvaceae
Malvaviscus arboreus	Malvaceae
Mammea americana	Clusiaceae
Mangifera indica	Anarcardiaceae
Manihot esculenta	Euphorbiaceae
Manihot sp	Euphorbiaceae
Maranta arundinacea	Marantaceae
Matricaria chamomilla	Asteraceae
Matricaria recutita	Asteraceae
Matricaria sp	Asteraceae
Melissa officinalis	Lamiaceae
Mentha citrata	Lamiaceae
Mentha x piperita	Lamiaceae
Mentha sp	Lamiaceae
Mentha spicata	Lamiaceae
Mimosa invisa	Fabaceae
Mimosa pudica	Fabaceae
Mimosa sp	Fabaceae
Momardica charantia	Cucurbitaceae
Morinda Citrifolia	Rubiaceae
Mucuna urens	Fabaceae
Musa acuminata	Musaceae
Musa paradisiaca	Musaceae
Musa sapientium	Musaceae
Musa sp	Musaceae
Myroxylon balsamum	Fabaceae
Nasturtium officinale	Brassicaceae
Nepeta cataria	Lamiaceae
Neurolaena lobata	Asteraceae

Nicotiana tabacum	Solanaceae
Nopalea cochenillifera	Cactaceae
Ochroma pyramidale	Malvaceae, also placed in Bombacaceae
Ocimum basilicum	Lamiaceae
Ocimum micranthum	Lamiaceae
Ocimum sp	Lamiaceae
Odontadenia verrucosa	Apocynaceae
Opuntia cochenillifera	Cactaceae
Opuntia ficus-indica	Cactaceae
Opuntia guatemalensis	Cactaceae
Oriza sativa	Poaceae
Oxalis corniculata	Oxalidaceae
Passiflora biflora	Passifloraceae
Passiflora edulis	Passifloraceae
Passiflora sp	Passifloraceae
Pedilanthus tithymaloides	Euphorbiaceae
Peperomia pellucida	Piperaceae
Persea americana	Lauraceae
Petiveria alliacea	Phytolaccaceae
Phaseolus vulgaris	Fabaceae
Phyllanthus amarus	Euphorbiaceae
Phyllanthus urinaria	Euphorbiaceae
Physalis angulata	Solanaceae
Physalis peruviana	Solanaceae
Pimenta dioica	Myrtaceae
Pimenta racemosa	Myrtaceae
Piper auritum	Piperaceae
Piper celtidifolum	Piperaceae
Piper nigrum	Piperaceae
Piper peltatum	Piperaceae
Piper umbellatum	Piperaceae
Plantago major	Plantaginaceae
Polygonum punctatum	Polygonaceae
Polypodium spp.	Polypodiaceae
Portulaca oleracea	Portulacaceae
Pouteria sapota	Sapotaceae
Protium sp	Burseraceae
Prunus persica	Rosaceae
Psidium friedrichsthalianum	Myrtaceae
Psidium guajava	Myrtaceae
Psidium guineense	Myrtaceae
Psychotria ipecacuanha	Rubiaceae
Punica granatum	Lythraceae, also placed in Punicaceae
Quassia amara	Simaroubaceae
Quercus sp	Fagaceae
Raphanus sativus	Brassicaceae
Rhipsalis casuta	Cactaceae
Rhizophora mangle	Rhizophoraceae
Ricinus communis	Euphorbiaceae
Rosa sp	Rosaceae
Rosmarinus officinalis	Lamiaceae

Rubus idaeus	Rosaceae
Rubus malacocarpus	Rosaceae
Rubus sp	Rosaceae
Rumex crispus	Polygonaceae
Ruta chalapensis	Rutaceae
Ruta graveolens	Rutaceae
Saccharum officinarium	Poaceae
Salix humboldtiana	Salicaceae
Salvia officinalis	Lamiaceae
Sambucus canadensis	Caprifoliaceae
Sambucus mexicana	Caprifoliaceae
Sambucus spp.	Caprifoliaceae
Sansevieria trifasciata	Dracenaceae
Sapium glandulosum	Euphorbiaceae
Sassafras variifolium	Lauraceae
Scoparia dulcis	Scrophulariaceae
Sechium edule	Cucurbitaceae
Selaginella sp.	Selaginellaceae
Senna occidentalis	Fabaceae
Senna reticulata	Fabaceae
Sida rhombifolia	Malvaceae
Silybum marianum	Asteraceae
Simarouba glauca	Simarubaceae
Synsepalum dulcificum	Sapotaceae
Smilax chirquensis	Smilacaceae
Smilax domingensis	Smilacaceae
Smilax lanceolata	Smilacaceae
Smilax sp.	Smilacaceae
Smilax spinosa	Smilacaceae
Solanum americanum	Solanaceae
Solanum mammosum	Solanaceae
Solanum nigrun	Solanaceae
Solanum potatorum	Solanaceae
Solanum quitoense	Solanaceae
Solanum tuberosum	Solanaceae
Sonchus oleraceus	Asteraceae
Sorghum vulgare	Poaceae
Spondias mombin	Anacardiaceae
Spondias purpurea	Anacardiaceae
Spondias sp	Anacardiaceae
Stachy officinalis	Lamiaceae
Stachytarpheta cayennensis	Verbenaceae
Stemmadenia sp	Apocynaceae
Stevia rebaudiana	Asteraceae
Symphytum officinale	Boraginaceae
Tabebuia chrysantha	Bignoniaceae
Tabebuia rosea	Bignoniaceae
Tagetes lucida	Asteraceae
Tamarindus indica	Fabaceae
Tanacetum parthenium	Asteraceae
Taraxacum officinale	Asteraceae

Taraxacum sp.	Asteraceae
Tecoma stans	Bignoniaceae
Theobroma cacao	Sterculiaceae
Thevetia sp.	Apocynaceae
Loasa triphylla	Loasaceae
Thymus serpyllum	Lamiaceae
Thymus vulgaris	Lamiaceae
Tilia platyphyllos	Malvaceae, also placed in Tiliaceae
Torenia fournieri	Scrophulariaceae
Trichilia havanensia	Meliaceae
Tridax procumbens	Asteraceae
Trifolium pectoralis	Fabaceae
Triumfetta lappula	Malvaceae, also placed in Tiliaceae
Triumfetta semitriloba	Malvaceae, also placed in Tiliaceae
Uncaria tomentosa	Rubiaceae
Urera baccifera	Urticaceae
Urtica dioica	Urticaceae
Verbena litoralis	Verbenaceae
Vernonia patens	Asteraceae
Vernonia sp	Asteraceae
Vernonia triflosculosa	Asteraceae
Vetiveria zizanoidea	Poaceae
Viola odorata	Violaceae
Vitis tiliifolia	Vitaceae
Witheringia solanacea	Solanaceae
Xanthosoma sagittifolium	Araceae
Yucca elaphantipes	Agavaceae
Yucca guatemalensis	Agavaceae
Zanthoxylum monphullum	Rutaceae
Zea mays	Poaceae
Zebrina pendula	Commelinaceae
Zingiber officinale	Zingiberaceae

Appendix B
The Proposed *Cuadro Basico*

Acnistus arborescens

Solanaceae

spanish name	**english name**
güitite(1,2,3,4,5,6,7)	Acnistus(4)

costa rican uses

reumatism(1) quemduras(2) irritaciones locales(3) *caution* only used externally. Alkaloids may cause heart problems. Hair is washed with sap for 15-20 minutes to control dandruff.(4) eczemas(5) affeciones del higado(6)

sources

1:curanderismo tradicional del costarricense p 167
/2:curanderismo tradicional del costarricense p 154
/3:curanderismo tradicional del costarricense p 149
/4:Jardin de plantas Medicinales
/5:curanderismo tradicional del costarricense p 142
/6:curanderismo tradicional del costarricense p 105
/7:San Luis Valley Survey 2004

Aloe vera

Liliaceae

spanish name

Sabila(4), zábila(3), sabila armaga(4), savila(5), Sábila(8,10,11,12)

english name

Aloe(4,6,7), Barbados Aloe(11)

costa rican uses

tosferina(1) pulmonia(2) sanar heridas(3) Used to encourage skin regeneration and heal recent scars and burns, or as a cooling compound for sunburns. The gel-like sap is directly applied from the split leaf.(4) calenturas(5) juice: purgative, tonic for liver, pancreas, kidneys, stomach. Externally: for burns, sunburns, rashes, stubborn ulcers, bed sores, diaper rash, boils, fungus, and to reduce scarring. May be harmful when taken excessivly internally.(6) Juice applied topically to inflammation and toothache. Leaf decoction used as an antidote to poisoning and as a purgative (FEO). Brazilians use the jelly for burns and sores (BDS) and to prevent alopecia.(7) Aloe is most commonly recognized for its curative properties when applied to burned or otherwise irritated skin.(8)

sources

1:curanderismo tradicional del costarricense p 182
/2:curanderismo tradicional del costarricense p 133
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:Jardin de plantas Medicinales
/5:curanderismo tradicional del costarricense p 57
/6:Arvigo: Rainforest Remedies p7
/7:Amazonian Ethnobotanical Dictionary
/8:Lieberman
/9:Plantas Medicinales de Puerto Rico p 92,118
/10: San Luis Valley Survey 2004
/11 UGA San Luis Valley Medicinal Plant Garden
/12:La utilidad de las plantas medicinales en Costa Rica

Ambrosia cumanensis

Asteraceae

spanish name | **english name**

Gotas Amargas (1,2,3,4) | Ragweed(1,2,3)

costa rican uses

contra afecciones hepáticas, calmante nervioso (4). Prepared as a tea for the liver and nerves.(2)

origin

Costa Rica(1)

sources

/1 UGA San Luis Valley Medicinal Plant Garden
/2:Lieberman
/3:Jardin Dominga
/4:Maria Ruth Martinez-Rodriguez: medicinales de EARTH

Argemone mexicana

Papaveraceae

spanish name
Cardosanto2,4,5,6,7,10,11,12), Cardosanto amarillo(1,8,9)

english name
Mexican Poppy(2,7,10)

costa rican uses

Asma(1) calenturas(4) tos(5) catarro(6) *Caution* used to regulate menstrual cycle and relieve pains by controlling ovarian function. Used to lower fevers, stop hemorrhaging, for treating anemia and asthma. Fresh seeds may induce vomiting.(7) inflamacciones(de ovarios)(8) hemorragia vaginal(9) Caution* used to regulate menstrual cycle and relieve pains by controlling ovarian function. Used to lower fevers, stop hemorrhaging, for treating anemia and asthma. Fresh seeds may induce vomiting(10)

origin

native to the Americas(7), Costa Rica (11)

distribution

Native to the Americas, and found throughout Mexico and in areas above 200 meters in Central America.(7)

sources

1:curanderismo tradicional del costarricense p 48
/2:Jardin Dominga
/3:Plantas Medicinales de Puerto Rico p12, 38
/4:curanderismo tradicional del costarricense p 55
/5:curanderismo tradicional del costarricense p 179
/6:curanderismo tradicional del costarricense p 61
/7:Lieberman
/8:curanderismo tradicional del costarricense p 110
/9:curanderismo tradicional del costarricense p 96
/10:Jardin de plantas Medicinales
/11:UGA San Luis Valley Medicinal Plant Garden
/12:La utilidad de las plantas medicinales en Costa Rica

Artemisia absinthium

Asteraceae

spanish name	**english name**
Ajenjo(1,3,4,5,6,7)	Wormwood(4,5)

costa rican uses

Tónico febrífugo, antihelmíntico, emenagogo.(1) Leaves are used in a tea to help with indigestion, stomach parasites, menstrual pains, and to simulate appetite.(3) Leaves are used in tea regulate menstruation, and to combat liver and gastrointestinal problems. The plant stimulates stomach and liver secretions; acts as an anti-inflammatory in cases of arthritis and rheumatism; and can be an antiseptic cleanser for skin injuries.(4)

origin

Europe (1)
European in origin but cultivated worldwide. In Greek mythology, the use of this plant was dedicated to the goddess Artemis.(4)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Plantas Medicinales de Puerto Rico p124, 125
/3:Jardin de plantas Medicinales
/4:Lieberman
/5:Jardin Dominga
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica

Bidens pilosa

Asteraceae

spanish name

Moriseco(2), Amor seco(3), Cadillo(3), Chilca(3), Isha sheta rao(3), pacunga(3), pirco(3)

english name

Dried Love (3)

costa rican uses

Herpes o fuegos en los labios, ronquera.(2) Chewing or gargling may help angina and sores in the mouth; infusions used as emmenagogue, antidysenteric and to allieviate chills. Decoction sometime miexed with aguardiente and milk(SOU). In piura, the root decoction is used for alcoholic hepatitis and worms (FEO). Around pucallpa, the leaf is balled up and applied to toothache. Leaves also used for headache VDF. IN Brazil it is used as a diuretic and to treat jauncdice. In the phillippines, flowers , mixed with cooked rice are fermented to make an alcoholic beverage. In Tonga the infusion of the flowers I sused to treat upset stomach in food poisoning. The "Exumas" grind sun-dried leaves and mix the with olive oil to make poultices for sores and lacerations. "Cuna" mix the crushed leaves with water to treat headaches (RVM). Used for aftosa, angina, diabetes, dysentery, dysmenorrhea, edema, hepatitis, jaundice, laryngitis, worms (RAR).(3)

sources

1:Plantas Medicinales de Puerto Rico p3
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Amazonian Ethnobotanical Dictionary p31
/4:San Luis Valley Survey 2004

Borago officinalis

Boraginaceae

spanish name
Borraja(1,3,4,5,6,7,8)

english name
Common Borage(7)

costa rican uses

lactancia(3) catarro(4) Calenturas(5) sudorificos(6)

sources

1:Jardin Dominga
/2:Plantas Medicinales de Puerto Rico p150, 151
/3:curanderismo tradicional del costarricense p 115
/4:curanderismo tradicional del costarricense p 61
/5:curanderismo tradicional del costarricense p 55
/6:curanderismo tradicional del costarricense p 59
/7 UGA San Luis Valley Medicinal Plant Garden
/8:La utilidad de las plantas medicinales en Costa Rica

Bougainvillea spp.

Nyctaginaceae

spanish name
Veranera(1)

sources

1:La utilidad de las plantas medicinales en Costa Rica
/2:Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Brugmansia candida

Solanaceae

spanish name

Reina de la noche(1,2)

costa rican uses

Caution This plant should never be ingested. It contains toxins that can cause death. It is used externally as an anaesthetic, especially for headaches, pain in the kidneys, and pain from the sciatic nerve. The plant can also be used to treat asthma, bruises, and arthritis.(1) asma, paperas, diviesos(2)

origin

Brazil (2)

sources

1:Lieberman
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH

Brugmansia suaveolens

Solanaceae

spanish name

floripondio(1,2,4),Toé(2), Maricahua(2), Reina de la Noche(3,4)

english name

Angel's trumpet (1,3)

costa rican uses

caution this plant is planted outside of homes because the pollen is thought to caues drowiness and help people sleep.(1)

sources

1:Jardin de plantas Medicinales
/2:Amazonian Ethnobotanical Dictionary p33
/3 UGA San Luis Valley Medicinal Plant Garden
/4:La utilidad de las plantas medicinales en Costa Rica

Buddleja americana

Loganiaceae

spanish name

Salvia(2,4), Salvia virgen(1,3,5,6,7)

english name

Wild sage(1), Virgin sage(3,5)

costa rican uses

an infusion of the root is used to combat insomnia. The leaves are used for regulatin menstruation, hemorrhoid relief, headaches, nausea, and for symptoms of allergies or asthma.(2) alergia, asma, insomnio, salpullidos, gastritis.(4) Roots and leaves can combat kidney infections and act as a diuretic. They have also been know n to be used as an anti-diarrhea treatment, a treatment for stomachache, and a treatment for rheumatism.(5)

origin

Am. Tropical(4),
Costa Rica(5,6)

sources

1:El uso de algunas plantas medicinales en costa rica p70
/2:Jardin de plantas Medicinale s
/3:Jardin Dominga
/4:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/5:Lieberman
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica

Caesalpinia pulcherrima

Fabaceae

spanish name
hoja sen(1)

english name
Malinche(1)

costa rican uses

used as alaxative, helps with gas pains, and for congestion.(1)

sources

1:Jardin de plantas Medicinales
/2:Arvigo: Rainforest Remedies p29

Calendula officinalis

Asteraceae

spanish name
Caléndula(2,3,4)

english name
Pot Marigold (3)

sources

1:Plantas Medicinales de Puerto Rico p158, 159
/2:Jardin Dominga
/3 UGA San Luis Valley Medicinal Plant Garden
/4:La utilidad de las plantas medicinales en Costa Rica

Capsicum frutescens

Solanaceae

spanish name

Chile picante(1,2,3,6,7), pimiento(5), charapilla(5), Chile picante (7)

english name

hot chili pepper(2,3,5)

costa rican uses

divieso o absceso(1) An excellent antioxidant when eaten. Hot chile leaf tea has been used to combat the flu and asthma. Chiles are also recommended for a variety of other ailments, including fever, weakness in convalescents, varicose veins, and neuralgia.(2) Tónico estomacal, linimento, contra forúnculos, inflamación ganglionar (hoja caliente)(6)

origin

Thought to have originated in the Antilles(2)
América Tropical(6)

distribution

Thought to have originated in the Antilles, but now cultivated throughout the world in a variety of climates.(2)

sources

1:curanderismo tradicional del costarricense p 140
/2:Lieberman
/3:Jardin Dominga
/4:Plantas Medicinales de Puerto Rico p126, 127
/5:Amazonian Ethnobotanical Dictionary p42
/6:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/7:La utilidad de las plantas medicinales en Costa Rica

Carica papaya

Caricaceae

spanish name

Papaya(11),[fruta bomba (Cuba), mamao (Brasil), papaya calentana (Colombia), mamón (Argentina), olocotón (Nicaragua), lechosa (Venezuela).](10)

english name

Papaya(2,3,5,6,7,9,10,11)

costa rican uses

affeciones del higado(2) anti-amoeba(3) Diarrea, coadyuvante digestivo, antihelmíntico.Forúnculos, hipertensión(5) Leaves are boiled ina ate to cleanse the stomach and help with digestion. Used on external wounds by rubbing the leaves directly on the surface. The flowers hav been eaten to induce mensturation, and to fight coughs and bronchitis. The seeds and milky latex from the turnk have been used to treate intestinal parasites, and the seeds have been eaten to burn fat and lose weight.(6) riñones(7) cosmeticos para el cutis(9) Los frutos se utilizan al natural para su consumo, así como para la elaboración de bebidas, helados y cocteles. La papaína presente en los frutos se utiliza para suavizar la carne antes de freirla, debido a su acción similar a la pepsina humana y animal.(10)

origin

América central(5)

sources

1:Plantas Medicinales de Puerto Rico p72, 98
/2:curanderismo tradicional del costarricense p 107
/3:curanderismo tradicional del costarricense p 39
/4:Arvigo: Rainforest Remedies p127
/5:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/6:Jardin de plantas Medicinales
/7:curanderismo tradicional del costarricense p 176
/8:Amazonian Ethnobotanical Dictionary p42
/9:curanderismo tradicional del costarricense p 160
/10:http://darnis.inbio.ac.cr/FMPro?-DB=UBIpub.fp3&-lay=WebAll&-Format=/ubi/detail.html&-Op=bw&id=182&-Find
/11:La utilidad de las plantas medicinales en Costa Rica

Cassia grandis

Fabaceae

spanish name

Carao o sandal, Carao (6)

costa rican uses

hemorragias nasales(1) dolor de cabeza(2) anemia(3) lacatancia(4)

sources

1:curanderismo tradicional del costarricense p 95
/2:curanderismo tradicional del costarricense p 79
/3:curanderismo tradicional del costarricense p 42
/4:curanderismo tradicional del costarricense p 115
/5:San Luis Valley Survey 2004
/6:La utilidad de las plantas medicinales en Costa Rica

Cassia reticulata

Fabaceae

spanish name	**english name**
retama(1), sarangundi(2,3,4), sorocontil(3)	wild senna(2,3,4)

costa rican uses

used in an alcoholic tincture to relieve arthritis, rheumatism and kidney infections. Leaves are applied directly
to the skin to relieve itching, allergies, rashes, and skin infections.(3) Applied externally to alleviate arthritis, rheumatism, and foot fungus. Taken internally to lower fever, to aid liver problems, and to alleviate
colitis or stomach gas. Depending on the preparation, the leaves in tea can work as either a laxative or as an anti-diarrhea agent. The root can induce vomiting.(4)

origin

Native to Central America(4)

distribution

Commonly found in dry areas of Nicaragua, El Salvador, and Guatemala, and on the Pacific slope in Costa Rica.(4)

sources

1:Amazonian Ethnobotanical Dictionary p45
/2:El uso de algunas plantas medicinales en costa rica p72
/3:Jardin de plantas Medicinales
/4:Lieberman

Catharanthus roseus

Apocynaceae

spanish name
mariposa(2), Isabelita(4), Mariposilla (6)

english name
Periwinkle(2)

costa rican uses

This plant has been known to help children with leukemia.(2) Cultivada; es muy común en todo el país.(5)

origin

Nativa de Madagascar; ampliamente cultivada en los trópicos.(5)

distribution

Es una especie cultivada que se encuentra presente en todo el país; sin embargo, en algunas playas del Pacífico central y sur (Savegre, Palma, Bandera), se ha naturalizado en las dunas costeras y llega a formar poblaciones bastantes puras.(5)

sources

1:Plantas Medicinales de Puerto Rico p77, 103
/2:Jardin de plantas Medicinales
/3:Arvigo: Rainforest Remedies p129
/4:Amazonian Ethnobotanical Dictionary p47
/5:http://darnis.inbio.ac.cr/FMPro?-DB=UBIpub.fp3&-lay=WebAll&-Format=/ubi/detail.html&-Op=bw&id=708&-Find
/6:La utilidad de las plantas medicinales en Costa Rica

Cecropia obtusifolia

Cecropiaceae

spanish name
Guarumo(1,2,3)

english name
Cecropia(1)

costa rican uses

caution* used in a tea to help respiratory problems, treat rheumatism, arthritis, or as a decongestant. The leaves have been given to cattle after birth for 3 days to expel the placenta.

sources

1:Jardin de plantas Medicinales
/2:San Luis Valley Survey 2004
/3:La utilidad de las plantas medicinales en Costa Rica

Chaptalia nutans

Asteraceae

spanish name
Árnica(1,3,4,5,6), Árnica falsa(2)

english name
Arnica(1,3,4), Silver Puff (5)

costa rican uses

antinflamatorio(2) Applied externally in a plaster for bruises and sprains. The roots can be used in tea as anti-parasitic agents, and the roots and leaves have both been used against ulcers.(3) used in a tea for sore throats, flu symptoms and as an anti-inflammatory to heal bruises and wounds.(4)

origin

Native to the Americas(3), Costa Rica (5)

distribu tion

Native to the Americas. Grows wild in disturbed areas, such as agricultural zones and roadsides.(3)

sources

1:Jardin Dominga
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Lieberman
/4:Jardin de plantas Medicinales
/5 UGA San Luis Valley Medicinal Plant Garden
/6:La utilidad de las plantas medicinales en Costa Rica

Chenopodium ambrosioides

Chenopodiaceae

spanish name

Cashua(1), Paico(1), Apazote(2,3,4,5,6,7,8,10,11,12, 13,14,15)

english name

Wormseed(1), wormwood(9), American Wormweed(12,13), Mexican Tea(12, 13,14),

costa rican uses

ulceras o llagas(2) affeciones del higado(3) anti-amoeba(4) fracturas dislocaciones torceduras, glopes(5) lombrices(6) dolor de muela(7) *caution* this plant contains toxic properties. As an infusion the leaves are taken to reduce fevers and relieve earaches. The essential oil is used on pets to control fleas and other pests.(9) antiparásitos, gastralgia, diarrea, úlceras cutáneas(11) Used as an anti-parasitic agent, as well as to ease kidney problems, stomachaches and stomach gasses, and hemorrhoids. Also used to regulate menstrual cycle and anti-inflammatory. **Caution** Apazote is an abortive agent and, in high doses, can cause heart attack, headache, and death from respiratory failure.(13)

origin

América Tropical(11) Native to the Americas(13), Costa Rica (14)

distribution

Native to the Americas. Found growing in temperate and tropical zones.(13)

sources

1:Amazonian Ethnobotanical Dictionary p50
/2:curanderismo tradicional del costarricense p 158
/3:curanderismo tradicional del costarricense p 104
/4:curanderismo tradicional del costarricense p 39
/5:curanderismo tradicional del costarricense p 75
/6:curanderismo tradicional del costarricense p 118
/7:curanderismo tradicional del costarricense p 84
/8:Plantas Medicinales de Puerto Rico p75
/9:Jardin de plantas Medicinales
/10:Arvigo: Rainforest Remedies p199
/11:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/12:Jardin Dominga
/13:Lieberman
/14 UGA San Luis Valley Medicinal Plant Garden
/15:La utilidad de las plantas medicinales en Costa Rica

Chrysanthemum parthenium

Asteraceae

spanish name
Altamisa(1,2,3,4,5),
Artemisa(3,4)

english name
Ferverfew(2,5)

costa rican uses

sudorificos(1) A spoonful of these seeds is reputed to be an effective treatment for migraines.(2) nervios(3) lombrices(4) Similar to Chamomile. Tea made from the flowers is used to regulate the menstrual cycle, digestion, and the nervous system. It can also be useful to combat asthma, migraine, and arthritis.(5)

origin

Native to Central and Southern Europe(5)

distribution

Native to Central and Southern Europe, but cultivated in other regions(5)

sources

1:curanderismo tradicional del costarricense p 59
/2:Jardin de plantas Medicinales
/3:curanderismo tradicional del costarricense p 128
/4:curanderismo tradicional del costarricense p 119
/5:Lieberman

Citrus aurantium

Rutaceae

spanish name

Naranja agria(1,3,4,6,9)

costa rican uses

dolor de cabeza(1) dolor oído,conjuntivitis, cefalea, gripe, tos, diarrea, asma, torceduras(3) nevrios (calmar los nervios)(4) aperitivos, estimulantes del apetito(6) hemorragia vaginal(7) diarrea(8)

origin

asia(3)

sources

1:curanderismo tradicional del costarricense p 79
/2:Plantas Medicinales de Puerto Rico p228, 229
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:curanderismo tradicional del costarricense p 129
/5:Arvigo: Rainforest Remedies p167
/6:curanderismo tradicional del costarricense p 47
/7:curanderismo tradicional del costarricense p 97
/8:curanderismo tradicional del costarricense p 70
/9:La utilidad de las plantas medicinales en Costa Rica
/10:Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Coriandrum sativum

Apiaceae

spanish name
culantro (5), Culantro del país (3)

english name
Cilantro(2), coriander(3)

costa rican uses

Used in a tea a a cough remedy or to treat eanemeia. Popular herb for cooking(2) colicos(4)

sources

1:Plantas Medicinales de Puerto Rico p170, 171
/2:Jardin de plantas Medicinales
/3:Amazonian Ethnobotanical Dictionary p55
/4:curanderismo tradicional del costarricense p 64
/5:La utilidad de las plantas medicinales en Costa Rica

Costus spicatus

Costaceae, also placed in Zingiberaceae

spanish name
Caña agria(1,2,3,5,6,7,8)

english name
Spiked Spiralflag (8)

costa rican uses

Tea made from this plant is used to combat bladder and kidney problems, as well as to lower inflammation of the uterus. It should not be used during the first four months of a pregnancy.(2) Contra afecciones renales(3) riñones(5) riñones(6)

sources

1:Jardin Dominga
/2:Lieberman
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:Plantas Medicinales de Puerto Rico p11
/5:curanderismo tradicional del costarricense p 174
/6:curanderismo tradicional del costarricense p 175
/7:San Luis Valley Survey 2004
/8 UGA San Luis Valley Medicinal Plant Garden

Croton draco

Euphorbiaceae

spanish name	**english name**
Targuá(1,2,3,4,5,6,7), Sangre de dragón (7)	Croton(1,2,3,6)

costa rican uses

The sap of the tree is principally used to combat mouth and dental problems, such as cavities, loose teeth, and sores. It can be taken internally to treat ulcers, and it is also applied topically to alleviate skin problems.(2) This tree is commonly used as a laxative, to relieve kidney pains, and to treat ulcers. The sap from the bark is also used as an anti-itch relief when applied directly to the skin.(3) dolor de muela(4) piquetes de insectos(5)

origin

Americas (2), Costa Rica (6)

distribution

Native to the Americas. Commonly found growing between sea level and 1,600 meters.(2)

sources

1:Jardin Dominga
/2:Lieberman
/3:Jardin de plantas Medicinales
/4:curanderismo tradicional del costarricense p 85
/5:curanderismo tradicional del costarricense p 151
/5:San Luis Valley Survey 2004
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica

Croton niveus

Euphorbiaceae

spanish name

Colpachí(1,2,3,4),
copolachí(1,3)

costa rican uses

apertivos, estimulantes del apetito(1) dolor de estomago(2) sudorificos(3)

sources

1:curanderismo tradicional del costarricense p 46
/2:curanderismo tradicional del costarricense p 81
/3:curanderismo tradicional del costarricense p 59
/4:San Luis Valley Survey 2004

Cymbopogon citratus

Poaceae

spanish name

Zacate limón(13), yerbaluisa(5), Maria luisa(5), yerba de limon(7)

english name

Lemon grass(2,4,5,7,10,12), fever-grass (6)

costa rican uses

an infusion of the leaves is taken to treat diarrhea and stomach aches, help digestion, relieve asthma and bronchitis, and to aid with cold and flu symptoms. The essential oils can be ued as an insect repellent, in perfumed soaps and detergents.(4) calenturas(6) Catarros, afecciones bronquiales.tos(8) catarro(9) An infusion of the leaves is taken to treat diarrhea and stomach aches, help digestion, relieve asthma and bronchitis, and to aid with cold and flu symptoms. The essential oils can be used as an insect repellent, in perfumed soaps and detergents.(10)

origin

India (8, 10)

distribution

Native to India, but found in worldwide distribution. Grows primarily in tropical climates.(10)

sources

1:Arvigo: Rainforest Remedies p103
/2:Jardin Dominga
/3:Plantas Medicinales de Puerto Rico p214, 215
/4:Jardin de plantas Medicinales
/5:Amazonian Ethnobotanical Dictionary p61
/6:curanderismo tradicional del costarricense p 55
/7:El uso de algunas plantas medicinales en costa rica p89
/8:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/9:curanderismo tradicional del costarricense p 61
/10:Lieberman
/11:San Luis Valley Survey 2004
/12 UGA San Luis Valley Medicinal Plant Garden
/13:La utilidad de las plantas medicinales en Costa Rica

Cymbopogon nardus

Poaceae

spanish name
Citronela(1,2,3,4)

english name
Citronella Grass(2,3,4)

costa rican uses

Catarros, afecciones bronquiales.(1) Used externally as an insect repellent. Also used as a perfume for soap, and as household disinfectant. Similarly to Zacate Limon (1) it has also been used internally against stomachaches.(2)

origin

sureste de Asia(1)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Lieberman
/3:Jardin Dominga
/4 UGA San Luis Valley Medicinal Plant Garden

Equisetum bogotense

Equisetaceae

spanish name
cola de caballo (1,2,3,4,5,6,7,8,9,10,11), yerba de platero(2)

english name
Horsetail(6,10)

costa rican uses

diarrea(1) hemorragias internas (intestinales y rectales)(2) resfriados(3) riñones(4) reumatism(5) this plant is used to stop hemorrhaging and for kidney pains.(6) hemorragias debidas a heridas en la piel(7)

origin

Costa Rica (10)

sources

1:curanderismo tradicional del costarricense p 70
/2:curanderismo tradicional del costarricense p 94
/3:curanderismo tradicional del costarricense p 162
/4:curanderismo tradicional del costarricense p 175
/5:curanderismo tradicional del costarricense p 166
/6:Jardin de plantas Medicinales
/7:curanderismo tradicional del costarricense p 93
/8:Jardin Dominga
/9:San Luis Valley Survey 2004
/10 UGA San Luis Valley Medicinal Plant Garden
/11:La utilidad de las plantas medicinales en Costa Rica

Eryngium foetidium

Apiaceae

spanish name

Culantro de Coyote(1,2,4,7,8,9,10,11,12,13)
Culantro de Caballo (13)

english name

Cilantro(4,9,13,14)

costa rican uses

nervios (buen sedante nervioso)(1) anemia(2) The leaves, which are rich in calcium, iron, riboflavin, vitamin B2, and carotene, are used to cure 0anemia, stimulate appetite, and purify blood. They are also abortive agents, and can be used for menstrual problems. The tea from this plant should not be consumed by pregnant women.(4) reumatismo(6) corazon(7) riñones(8) antianémico, estimula apetito, contra vómitos(10) apertivos, estimulantes del apetito(11)

origin

América Tropical(10)

sources

1:curanderismo tradicional del costarricense p 128
/2:curanderismo tradicional del costarricense p 42
/3:Arvigo: Rainforest Remedies p69
/4:Lieberman
/5:Plantas Medicinales de Puerto Rico p325
/6:curanderismo tradicional del costarricense p 171
/7:curanderismo tradicional del costarricense p 65
/8:curanderismo tradicional del costarricense p 173
/9:Jardin Dominga
/10:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/11:curanderismo tradicional del costarricense p 47
/12:curanderismo tradicional del costarricense p 104
/13 UGA San Luis Valley Medicinal Plant Garden
/9:Jardin de plantas Medicinales

Erythrina lanceolata
Fabaceae

sources
Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Erythrina spp.
Fabaceae

spanish name
Poró colorado, Poró, poró
copey(5)

costa rican uses
reumatismo(1) fracturas dislocaciones torceduras, glopes(2) anemia(3), insomnio(4) flor somnífera, hojas sedante e hipnótico(5)

sources
Erythrina sp.
/1:curanderismo tradicional del costarricense p 166
/2:curanderismo tradicional del costarricense p 76
/3:curanderismo tradicional del costarricense p 43
/4:curanderismo tradicional del costarricense p 113
Erythrina fusca
/5:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
Erythrina poeppigiana
/6:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/7:Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Eucaliptus sp (globulus)

Myrtaceae

spanish name
Eucalipto(1,2,3,4)

english name
Eucalyptus(3,4)

costa rican uses

reumatism(1) calentursas del paludismo(2) tosferina(3)

sources

1:curanderismo tradicional del costarricense p 167
/2:curanderismo tradicional del costarricense p 58
/3:El uso de algunas plantas medicinales en costa rica p35
/4:San Luis Valley Survey 2004

Gossypium hirsutum

Malvaceae

spanish name
Algodón (1,2)

english name
Cotton(1)

costa rican uses

The leaves mixed with salt are taken by mouth to help ear pains, diarrhea, or for menstrual relief.

sources

/1:Jardin de plantas Medicinales
/2:La utilidad de las plantas medicinales en Costa Rica

Hamelia patens

Rubiaceae

spanish name
Coloradillo(2), Coralillo (3), Fosforillo(3)

english name
Redhead(2)

origin

Costa Rica (2)

sources

/1:Plantas Medicinales de Puerto Rico p405
/2 UGA San Luis Valley Medicinal Plant Garden
/3:La utilidad de las plantas medicinales en Costa Rica

Hibiscus sabdariffa

Malvaceae

spanish name
Rosa de Jamaica (1,2,3), Sarril (3)

english name
Roselle (2)

sources

Jardin Dominga
/2 UGA San Luis Valley Medicinal Plant Garden
/3:La utilidad de las plantas medicinales en Costa Rica

Ilex paraguariensis

Aquifoliaceae

sources

Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Jatropha gossypiifolia

Euphorbiaceae

spanish name

Frailecillo(2,3,4,5,6,7,8,9)

english name

Bellyache(2,3,5,8),
nettlesperge(2,3,4)

costa rican uses

caution This plant has known natural abortive properties. The seeds may cause diarrhea, disrupt circulation, and respiration. Used to help decrease cholesterol in the body, relieve menstrual pain, or reduce fever.(1) *Caution* This plant has known natural abortive properties. The seeds may cause diarrhea, disrupt circulation, and respiration. Used to help decrease cholesterol in the body, relieve menstrual pain, or reduce fever.(2) Contra afecciones renales y hepáticas; úlceras(5)

origin

Native to the Americas(3), Am. Tropical(6)

distribution

Native to the Americas, and commonly found in hot, humid areas.(3)

sources

1:Plantas Medicinales de Puerto Rico p86, 112
/2:Jardin de plantas Medicinales
/3:Lieberman
/4:Jardin Dominga
/5:El uso de algunas plantas medicinales en costa rica p38
/6:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/7:San Luis Valley Survey 2004
/8 UGA San Luis Valley Medicinal Plant Garden
/9:La utilidad de las plantas medicinales en Costa Rica

Justicia pectoralis

Acanthaceae

spanish name	**english name**
Tilo(1,2,4,5,6,7,8,9)	carpenter bush(1,8), linden flower(2,4,6)

costa rican uses

Sometimes used to calm nerves, relieve insomnia, headaches, menstrual pains, indigestion, and gas. Often used to cure chronic coughs and bronchitis(4) Calmante nervioso. Golpes, toreceduras(5) Sometimes used to calm nerves, relieve insomnia, headaches, menstrual pains, indigestion, and gas. Often used to cure chronic coughs and bronchitis.(6)

origin

Am. Tropical(5)
American Tropics(6),
Costa Rica (8)

distribution

Native to the American tropics. Often found in hot, humid lowland areas(6)

sources

1:El uso de algunas plantas medicinales en costa rica p86
/2:Jardin Dominga
/3:Plantas Medicinales de Puerto Rico p15, 41
/4:Jardin de plantas Medicinales
/5:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/6:Lieberman
/7:San Luis Valley Survey 2004
/8 UGA San Luis Valley Medicinal Plant Garden
/9:La utilidad de las plantas medicinales en Costa Rica

Justicia tinctoria

Acanthaceae

spanish name	**english name**
Azul de mata(1,2,3,4,5,6,7), Sacatinta(1,2,3,6,7)	Indigo(1,2,4)

costa rican uses

Used externally to treat chest problems and bronchitis, or applied to the hair and scalp for dandruff. The shoots and leaves have been used to dye fabrics dark blue-purple(1) used externally to treat chest problems and bronchitis, or applied to the hair and scalp for dandruff. The shoots and leaves have been used to dye fabrics dark blue-purple.(3) anticaspa, lavados de cabello, dolores de pecho(4)

origin

Americas (2), Sureste de Asia (5), Costa Rica (6)

distribution

Native to the Americas, ranging from Mexico to Colombia. Found primarily in high, cool climates.(2)

sources

1:Jardin Dominga
/2:Lieberman
/3:El uso de algunas plantas medicinales en costa rica p26
/4:Jardin de plantas Medicinales
/5:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica

Kalanchoe pinnata

Crassulaceae

spanish name
Hoja de Aire(2,3,4,5)

english name
Kalanchoe(4), Air plant(4), life plant (5), Leaf of life(3)

costa rican uses

contra bronquitis, resfríos, catarro(2) Flowers and leaves are used to make ear drops for ear pains, the leaves may be eaten for coughs, and soaking the leaves with a towel and applyin to the forehead is used to treat headaches.(4)

origin

Madagascar(2)

sources

1:Arvigo: Rainforest Remedies p105
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Jardin Dominga
/4:Jardin de plantas Medicinales
/5 UGA San Luis Valley Medicinal Plant Garden

Linum usitatissimum

Linaceae

spanish name
Linaza(1,2,3,4,5)

english name
linseed (2), flax (2)

costa rican uses

irritacion(1) The seeds eaten whole cause intestinal motility and are used as a treatment for chronic constipation. When boiled the seeds lose their medicinal properties. Chewed seeds provide essential fatty acids which may be used to treat coughs, high fevers,gums, and uterus problems(2) eczemas(3) reumatismo(4) hipertension(5)

sources

1:curanderismo tradicional del costarricense p 113
/2:Jardin de plantas Medicinales
/3:curanderismo tradicional del costarricense p 142
/4:curanderismo tradicional del costarricense p 169
/5:curanderismo tradicional del costarricense p 102

Lippia alba

Verbenaceae

spanish name	**english name**
Juanilama(1,2,3,4,5,6,7,8,9,10), azul de mata(6), Mastrante(1)	Lemon verbena(1,3,4,7), Bushy Lippia (9)

costa rican uses

contra gastritis y cólicos hepáticos(2) said to increase blood circulation, important for people with dieabetes. Also decreases inflammation helping with arthritis, rheumatism, sprains, liver problems, and colitis. May relieve indigestion, stomach pains, diarrhea, and menstrual pains. The essential oils are used as a natural insect repellant.(4) reumatismo(5) reumatismo(6) Used externally to treat rheumatic pain or colds. Taken internally for gastrointestinal problems, liver problems, and as a fever-reducer or expectorant.(7)

origin

pacífico tropical (2), Costa Rica (9)

sources

1:El uso de algunas plantas medicinales en costa rica p52
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Jardin Dominga
/4:Jardin de plantas Medicinales
/5:curanderismo tradicional del costarricense p 171
/6:curanderismo tradicional del costarricense p 165
/7:Lieberman
/8:San Luis Valley Survey 2004
/9 UGA San Luis Valley Medicinal Plant Garden
/10:La utilidad de las plantas medicinales en Costa Rica

Lippia dulcis

Verbenaceae

spanish name
Orozuz (2, 5)

english name
Mexican Lippia (4)

origin

Costa Rica (4)

sources

1:Arvigo: Rainforest Remedies p123
/2:Jardin Dominga
/3:Plantas Medicinales de Puerto Rico p204, 205
/4 UGA San Luis Valley Medicinal Plant Garden
/5:La utilidad de las plantas medicinales en Costa Rica

Lippia graveolens

Verbenaceae

spanish name

Orégano(1,2,3,6,8,9), oregano cimaroon(4)

english name

Wild Marjoran(4), Oregano(2,3,6), Mexican Oregano (8)

costa rican uses

Asma, prob bronquiales(1) used as an infusion to relieve bronchial problems, asthma, and coughs, as well as headaches, menstrual pains, kidney pains, stiff necks, sore gums, an swelling. Commonly used as a herb for cooking.(2) Used as an infusion to relieve bronchial problems, asthma, and coughs, as well as headaches, menstrual pains, kidney pains, stiff necks, sore gums, and swelling. Commonly used as a herb for cooking.(6)

origin

Am. Tropical(1) Native to the Americas from southern Texas to Nicaragua(6), Costa Rica (8)

distribution

Native to the Americas from southern Texas to Nicaragua. Grows in a variety of environments.(6)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Jardin de plantas Medicinales
/3:Jardin Dominga
/4:El uso de algunas plantas medicinales en costa rica p61
/5:Arvigo: Rainforest Remedies p125
/6:Lieberman
/7:San Luis Valley Survey 2004
/8 UGA San Luis Valley Medicinal Plant Garden
/9:La utilidad de las plantas medicinales en Costa Rica

Lycopersicon esculentum

Solanaceae

spanish name
Tomate(1,4), Tomatillo(2,3)

english name
Tomato(1)

costa rican uses

fruit eaten to help clot blood, while the leaves are used to relieve canker sores.(1) dolor de garganta(2) estomatitis o gusanillo(3)

sources

1:Jardin de plantas Medicinales
/2:curanderismo tradicional del costarricense p 84
/3:curanderismo tradicional del costarricense p 145
/4:La utilidad de las plantas medicinales en Costa Rica

Malva parviflora

Malvaceae

spanish name
Malva (1,2)

english name
Mallow(1)

sources

/1 UGA San Luis Valley Medicinal Plant Garden
/2:La utilidad de las plantas medicinales en Costa Rica

Malva sp

Malvaceae

spanish name
Malva(1,2,3)

costa rican uses

corazon(1) inflamacion de intestinos(2)

sources

1:curanderismo tradicional del costarricense p 66
/2:curanderismo tradicional del costarricense p 111
/3:San Luis Valley Survey 2004

Malvaviscus arboreus

Malvaceae

spanish name	**english name**
Amapola(1,2)	Turk's cap(1)

costa rican uses

planted as an ornamental(1) afecciones del higado(2)

sources

1:Jardin de plantas Medicinales
/2:curanderismo tradicional del costarricense p 103

Manihot esculenta

Euphorbiaceae

spanish name	**english name**
Yuca (1,2,3)	cassava (1), manioc (1)

costa rican uses

the root is eaten as a starchy vegetable and is used for tapioca. Also used as a glue for postage stamps. Sugar, alcoholic drinks and acetone are derived from this plant.(1) hoja macerada contra cefalea(2)

origin

Brasil(2)

sources

1:Jardin de plantas Medicinales
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:La utilidad de las plantas medicinales en Costa Rica

Maranta arundinacea

Marantaceae

spanish name

Sagú(1,3)

costa rican uses

The root is known for its nutritive properties, and is used in cases of anemia, malnutrition, and diarrhea. It is also recommended for nursing mothers(1) Anemia(2)

origin

pacifico seco (3)

sources

1:Lieberman
/2:Plantas Medicinales de Puerto Rico p91, 117
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH

Matricaria chamomilla

Asteraceae

spanish name	**english name**
Manzanilla(1,2,3,4,5)	Chamomile(2,3,4)

costa rican uses

diarrea(1) Tea made from Chamomile flowers is recommended as a light tranquilizer. Chamomile also is used to combat gastrointestinal discomfort, and respiratory problems associated with the cold and the flu. In plasters, Chamomile can be used to soothe tired eyes, heal hemorrhoids, cuts, and sores, and combat inflammation.(3)

origin

Mediterranean and Asia Minor (3)

distribution

Native to the Mediterranean and Asia Minor, but it has been "naturalized" throughout the world.(3)

sources

1:curanderismo tradicional del costarricense p 71
/2:Jardin Dominga
/3:Lieberman
/4:San Luis Valley Survey 2004
/5:La utilidad de las plantas medicinales en Costa Rica

Matricaria recutita

Asteraceae

spanish name
Manzanilla(1,2)

english name
German Chamomile(2)

costa rican uses

antidarreico, antiespasmódico, antidismenorreico(1)

origin

Europa

sources

Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2 UGA San Luis Valley Medicinal Plant Garden

Melissa officinalis

Lamiaceae

spanish name
Melisa (1,2), Toronjil (2)

english name
Lemon Balm(1)

sources

/1 UGA San Luis Valley Medicinal Plant Garden
/2:La utilidad de las plantas medicinales en Costa Rica

Mentha citrata

Lamiaceae

spanish name
Anticólico(3), Yerba Buena(1,2,3,5,6)

english name
Spearmint(1,3), Mint(3,5)

costa rican uses

An infusion of the aromatic leaves is taken for insomnia, nervousness, and gastro intestinal disorders. For pregnant women this plant has been used to alleviate morning sickness during the first month of pregnancy and help discharge accumulated milk.(2)

sources

1:Jardin Dominga
/2:Jardin de plantas Medicinales
/3:Lieberman
/4:San Luis Valley Survey 2004
/5 UGA San Luis Valley Medicinal Plant Garden
/6:La utilidad de las plantas medicinales en Costa Rica

Mentha sp

Lamiaceae

spanish name
Menta(1,5), Hierbabuena(3), Yerbabuena(4)

english name
Mint(2)

costa rican uses

calmante nervioso, contra prob gastrointestinales(1) The plant's oils have been used for digestion, to cure colic and gas pains, stimulate the liver and gallbladder, and increase blood flow. It may also be taken to relieve morning sickness and insomnia. Used externally to help to soothe skin irritation and relieve respiratory problems. *Caution* Do not use with kidney problems(2) reumatismo(3) colicos(4)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Lieberman
/3:curanderismo tradicional del costarricense p 171
/4:curanderismo tradicional del costarricense p 64
/5:San Luis Valley Survey 2004

Mentha x piperita

Lamiaceae

spanish name

menta(1), Yerbabuena(2), Anticólico(2), hierba buena(3), Yerba Buena (5)

english name

Peppermint(1, 5)

costa rican uses

The plant's oils have been ued for digestion, to cure colic and gas pains, stimulate the liver and gallbladder, and increase blood flow. It may also be taken to relieve morning sickness and insomnia. Used externally to help to soothe skin irritation and relieve respiratory problems. *caution* do not use with kidney problems(1) Cólicos gastointestinales,contra dolores menstruales(3)

sources

1:Jardin de plantas Medicinales
/2:Jardin Dominga
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:Plantas Medicinales de Puerto Rico p203
/5 UGA San Luis Valley Medicinal Plant Garden

Momardica charantia

Cucurbitaceae

spanish name	**english name**
sorosí (1,2,3,4,7,8), pepinillo(4), cundeamor(4)	Balsam Pear (7), Wild balsam apple(4)

costa rican uses

irritacion(1) Antidiabético, colitis, dolencias hepáticas.(2)

origin

sureste de Asia (2)

sources

1:curanderismo tradicional del costarricense p 113
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Jardin Dominga
/4:El uso de algunas plantas medicinales en costa rica p77
/5:Plantas Medicinales de Puerto Rico p14, 40
/6:Arvigo: Rainforest Remedies p165
/7 UGA San Luis Valley Medicinal Plant Garden
/8:La utilidad de las plantas medicinales en Costa Rica

Morinda citrifolia

Rubiaceae

spanish name	**english name**
Noni (1,2)	Indian Mulberry (2)

sources

/1:San Luis Valley Survey 2004
/2 UGA San Luis Valley Medicinal Plant Garden

Musa paradisiaca

Musaceae

spanish name	**english name**
Banana negro(2)	Banana(2)

costa rican uses

The stem of the plant is cut and the sap inside has a high iron content. Used to treat simple anemia.(2)

sources

1:Plantas Medicinales de Puerto Rico p413
/2:Jardin de plantas Medicinales

Neurolaena lobata

Asteraceae

spanish name

gavilana (2,3,4,5,6,7,8, 9,10,11,12,13,14,15), Capitana(2,8)

english name

Jackass bitters (5,6,8,14)

costa rican uses

Antidiarréico, antidiabético(3) calenturas(4) The tea from this plant is principally used to combat diarrhea, stomachaches, and stomach parasites. It can also be applied topically for skin problems such as allergies and mange.(6) dolor de estomago(7) this plant is used ina tea to combat diarrhea and reduce fevers.(8) affeciones del higado(9) Malaria(11) anti-amoeba(12)

origin

Am. Tropical(3) Native to the American wet tropics.(6) Costa Rica (14)

distribution

Native to the American wet tropics.(6)

sources

1:Plantas Medicinales de Puerto Rico p428
/2:El uso de algunas plantas medicinales en costa rica p41
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:curanderismo tradicional del costarricense p 56
/5:Jardin Dominga
/6:Lieberman
/7:curanderismo tradicional del costarricense p 81
/8:Jardin de plantas Medicinales
/9:curanderismo tradicional del costarricense p 105
/10:Arvigo: Rainforest Remedies p99
/11:curanderismo tradicional del costarricense p 124
/12:curanderismo tradicional del costarricense p 38
/13:San Luis Valley Survey 2004
/14 UGA San Luis Valley Medicinal Plant Garden
/15:La utilidad de las plantas medicinales en Costa Rica

Nicotiana tabacum

Solanaceae

spanish name
tabaco(1,2,3)

english name
Tobacco(3)

costa rican uses

picazon(1) gusaneras(2)

sources

1:curanderismo tradicional del costarricense p 151
/2:curanderismo tradicional del costarricense p 147
/3:San Luis Valley Survey 2004

Nopalea cochenillifera

Cactaceae

spanish name
tuna(1,2,3,4)

costa rican uses

inflmacion de intestinos(1) tosferina(2) affeciones del higado(3)

sources

1:curanderismo tradicional del costarricense p 111
/2:curanderismo tradicional del costarricense p 182
/3:curanderismo tradicional del costarricense p 107
/4:San Luis Valley Survey 2004

Ocimum basilicum

Lamiaceae

spanish name	**english name**
Albahaca(1,3,5,6,7,8)	Basil(1,3,6), Sweet Basil (7)

costa rican uses

used for relief of asthma and bronchitis by cooking entire plant and inhaling the vapor. An infusion is taken to help ear pain, parasites, and to stimulate children's appetites. Herb used for cooking.(3) dolor de oido(5) Used for relief of asthma and bronchitis by cooking entire plant and inhaling the vapor. An infusion is taken to help ear pain, parasites, and to stimulate children's appetites. Herb used for cooking.(6)

origin

tropical asia(6)

distribution

Originating in tropical Asia, this plant has been cultivated throughout the world. It grows most commonly in cool, partly shaded areas.(6)

sources

1:Jardin Dominga
/2:Arvigo: Rainforest Remedies p23
/3:Jardin de plantas Medicinales
/4:Plantas Medicinales de Puerto Rico p4, 30
/5:curanderismo tradicional del costarricense p 86
/6:Lieberman
/7 UGA San Luis Valley Medicinal Plant Garden
/8:La utilidad de las plantas medicinales en Costa Rica

Ocimum micranthum

Lamiaceae

spanish name
Albahaca Cimarrona (1,3,4), Albahaca de Gallina(1)

english name
Mint (1)

costa rican uses

Dolor de garganta, afecciones digestivas(3)

origin

pacifico seco(3), Costa Rica (4)

sources

1:Jardin Dominga
/2:Plantas Medicinales de Puerto Rico p4
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4 UGA San Luis Valley Medicinal Plant Garden

Petiveria alliacea

Phytolaccaceae

spanish name
Zorrillo(2,6), Anamu(2), Ajillo(1,2,4,5,6)

english name
Guinea Henweed(5)

costa rican uses

used in a tincture to help clear sinuses and work as a diurtetic.(1) anemia(4)

origin

Costa Rica (5)

sources

1:Jardin de plantas Medicinales
/2:El uso de algunas plantas medicinales en costa rica p17
/3:Plantas Medicinales de Puerto Rico p5, 31
/4:Jardin Dominga
/5 UGA San Luis Valley Medicinal Plant Garden
/6:La utilidad de las plantas medicinales en Costa Rica

Pimenta dioica

Myrtaceae

spanish name	english name
Jamaica(1,2), Bay Rum (2)	Allspice(1)

sources

/1 UGA San Luis Valley Medicinal Plant Garden
/2:La utilidad de las plantas medicinales en Costa Rica

Piper spp.

Piperaceae

spanish name	english name
Anisillo(1), cordoncillo(2), Pimienta(3), Santa María(4), hoja de la estrella(5), poró gigante(6)	

costa rican uses

hidropesia(2) Digestivo(3) turmores superficiales(5) lor somnífera, hojas sedante e hipnótico(6)

origin

India(3),
América del sur(6)

sources

/1:Piper auritum: La utilidad de las plantas medicinales en Costa Rica
/2:Piper celtidifolum: curanderismo tradicional del costarricense p 101
/3:Piper nigrum: Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:Piper peltatum: La utilidad de las plantas medicinales en Costa Rica
/5:Piper umbellatum: curanderismo tradicional del costarricense p 157
/6:Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Plantago major

Plantaginaceae

spanish name	**english name**
llantén(1,2,3,4,5,7,8,9,10,11,12), yanten(7,10)	Plantain(1,5), Common Plantain(3,4,12)

costa rican uses

commonly used to stimulate bowel movements and to treat urninary tract infections. Also said to stop hemorrhaging, sometimes used as a blood cleanser, diuretic expectorant, and decongestant. Used topically to heal bee stings, burns, and surface wounds.(1) Diarrea, disentería, afecciones hepáticas, laxante.(2) Commonly used to stimulate bowel movements and to treat urinary tract infections. Also said to stop hemorrhaging, sometimes used as a blood cleanser, diuretic, expectorant, and decongestant. Used topically to heal bee stings, burns, and surface wounds. Locally, it is widely renowned to be effective against stomach problems, such as ulcers and gastritis.(3) dolor de estomago(7) affeciones del higado(8) corazon(9) ojos(10)

origin

Not native to Americas(3)

distribution

Not native to the Americas, but widely spread.(3)

sources

1:Jardin de plantas Medicinales
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Lieberman
/4:Jardin Dominga
/5:El uso de algunas plantas medicinales en costa rica p55
/6:Plantas Medicinales de Puerto Rico p56, 62
/7:curanderismo tradicional del costarricense p 82
/8:curanderismo tradicional del costarricense p 106
/9:curanderismo tradicional del costarricense p 65
/10:curanderismo tradicional del costarricense p 131
/11:San Luis Valley Survey 2004
/12 UGA San Luis Valley Medicinal Plant Garden

Polypodium spp.
Polypodiaceae

spanish name
hoja de ciervo(1), Calaguala(2)

costa rican uses
riñones(1)

sources
/1:curanderismo tradicional del costarricense p 175
/2:La utilidad de las plantas medicinales en Costa Rica
/3:Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Psidium guajava
Myrtaceae

spanish name
Guayabo(1,2,5,7)
Guayaba(6,8,9)

costa rican uses
nervios (buen calmante para excitationes nerviosas)(1) diarrea(2) apertivos, estimulantes del apetito(5) Diarreas, úlceras en la piel(6) anti-amoeba(7)

origin
América tropical(6)

sources
1:curanderismo tradicional del costarricense p 128
/2:curanderismo tradicional del costarricense p 70
/3:Plantas Medicinales de Puerto Rico p194, 195
/4:Arvigo: Rainforest Remedies p87
/5:curanderismo tradicional del costarricense p 47
/6:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/7:curanderismo tradicional del costarricense p 38
/8:San Luis Valley Survey 2004
/9:La utilidad de las plantas medicinales en Costa Rica

Quassia amara

Simaroubaceae

spanish name
Hombre Grande(6,7), hombron(3), cuasia(3)

english name
Bitter Wood(3) Quassia Wood (6)

costa rican uses

Febrífugo, aperitivo (1) Used in numerous Central and South American countries for problems of the digestive system, including diarrhea, stomachache, and parasites.(4)

origin

American tropics(4),
Costa Rica (6)

distribution

Native to the American tropics, ranging from Mexico to the Amazon basin. Grows primarily in hot, humid zones(4)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Jardin Dominga
/3:El uso de algunas plantas medicinales en costa rica p49
/4:Lieberman
/5:San Luis Valley Survey 2004
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica

Raphanus sativas

Brassicaceae

spanish name
Rabano(1,2)

english name
Radish(1)

costa rican uses

used in salads(1) piedras en la vejiga(2)

sources

1:Jardin de plantas Medicinales
/2:curanderismo tradicional del costarricense p 132

Ricinus communis

Euphorbiaceae

spanish name
Aceite de castor de la higuerilla(1), Higuera(2), Higuerilla(5,6), Recino(6)

english name
Castor oil plant(5)

costa rican uses

heridas(1) antineumonía, estreñimiento, traumatismo, cefaleas(2) *caution* seeds are toxic and poisonous. The leaves have been used as a laxative, diuretic, and to stimulate lactation. The seeds have volatile oils which are burnt ceremonially at wakes, for candles and as an insecticide.(4)

origin

África(2)

sources

1:curanderismo tradicional del costarricense p 147
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Plantas Medicinales de Puerto Rico p206, 207
/4:Arvigo: Rainforest Remedies p37
/5:Jardin de plantas Medicinales
/6:La utilidad de las plantas medicinales en Costa Rica

Rosmarinus officinalis

Lamiaceae

spanish name	**english name**
Romero(1,2,3,4,6,7,8,9,10,11,12,13,14)	Rosemary(6,8,9,12,13)

costa rican uses

heridas(1) reumatism(2) catarro(3) reumatismo(4) Used to stimulate blood circulation, relieve stress, treat mild depression, ease pain in aching joints, earaches, menstrual pains. Has been used to aid in digestion, relieving ulcers, and swollen glands, and to treat intestinal gas and stomach pains. Often used as a herb for culinary purposes.(6) ojos (lavados de ohos infectados)(7) Used to stimulate blod circulation, relieve stress, treat mild depression, ease pain in aching joints, earaches, menstrual pains. Has been used to aid in digestion, relieving ulcers, and swollen glands, and to treat intestinal gas and stomach pains. often used as an herb for culinary purposes.(9) granos(10) dolor de muela(11)

origin

Native to the Mediterranean(6)

distribution

Of Mediterranean origin, but cultivated in temperate areas worldwide(6)

sources

1:curanderismo tradicional del costarricense p 147
/2:curanderismo tradicional del costarricense p 167
/3:curanderismo tradicional del costarricense p 61
/4:curanderismo tradicional del costarricense p 170
/5:Plantas Medicinales de Puerto Rico p78, 104
/6:Lieberman
/7:curanderismo tradicional del costarricense p 131
/8:Jardin Dominga
/9:Jardin de plantas Medicinales
/10:curanderismo tradicional del costarricense p 146
/11:curanderismo tradicional del costarricense p 85
/12:San Luis Valley Survey 2004
/13 UGA San Luis Valley Medicinal Plant Garden
/14:La utilidad de las plantas medicinales en Costa Rica

Rumex crispus

Polygonaceae

spanish name	**english name**
Riubarbo(1,2)	Curly dock(2)

sources

1:Plantas Medicinales de Puerto Rico p176, 177
/2 UGA San Luis Valley Medicinal Plant Garden
/3:Jardin Dominga

Ruta chalapensis

Rutaceae

spanish name

Ruda(1,2,3,4,5,6,7,8,9,11,12,13, 14,15,16)

english name

Rue(5,7,9,11,16) Fringed Rue (14)

costa rican uses

diarrea(1) fracturas dislocaciones torceduras, glopes(2) emengago(3) reumatismo(4) nervios (magnifico sedante, und la sordera incipiente)(6) dolor de oido(8) *caution* known as a very strong abortive agent. Used to reduce swollen glands, treat intestinal worms, stop hemorrhaging, clean eyes and ears, treat headaches, calm nerves, strengthen capillaries, relieve menstrual cramps, and treat high blood pressure.(9) *Caution* Known as a very strong abortive agent. Used to reduce swollen glands, treat intestinal worms, stop hemorrhaging, clean eyes and ears, treat headaches, calm nerves, strengthen capillaries, relieve menstrual cramps, and treat high blood pressure. Used locally in San Luis as a remedy for earaches and toothaches.(11) inflamaciones de glandulas(12) reumatism(13)

origin

Native to the Mediterranean and Asia Minor(11)

distribution

Native to the Mediterranean and Asia Minor, but cultivated in temperate zones at altitudes above 1500 meters.(11)

sources

1:curanderismo tradicional del costarricense p 71
/2:curanderismo tradicional del costarricense p 77
/3:curanderismo tradicional del costarricense p 88
/4:curanderismo tradicional del costarricense p 170
/5:Jardin Dominga
/6:curanderismo tradicional del costarricense p 129
/7:El uso de algunas plantas medicinales en costa rica p66
/8:curanderismo tradicional del costarricense p 87
/9:Jardin de plantas Medicinales
/10:Plantas Medicinales de Puerto Rico p80
/11:Lieberman
/12:curanderismo tradicional del costarricense p 109
/13:curanderismo tradicional del costarricense p 167
/14 UGA San Luis Valley Medicinal Plant Garden
/15:La utilidad de las plantas medicinales en Costa Rica
/16:San Luis Valley Survey 2004

Salix humboldtiana

Salicaceae

spanish name

Sauce (1,2), Sauce llorón(2)

sources

/1:San Luis Valley Survey 2004
/2:La utilidad de las plantas medicinales en Costa Rica

Salvia officinalis

Lamiaceae

spanish name	**english name**
Salvia (1,3,4,5,6), Sage(2)	Sage(1,2,6)

costa rican uses

Can be used in an antibacterial ointment or as an expectorant.(1) can be used in an antibacterial ointment or as an expectorant(2) corazon(3)

sources

1:Lieberman
/2:Jardin de plantas Medicinales
/3:Jardin Dominga
/4:curanderismo tradicional del costarricense p 66
/5:San Luis Valley Survey 2004
/6 UGA San Luis Valley Medicinal Plant Garden

Sambucus mexicana

Caprifoliaceae

spanish name
Saúco(1,2,3,4,5,7,8,9,10)

english name
Mexican Elderberry(1,9,10),
Elder(2)

costa rican uses

Infusions of the leaves and flowers have traditionally been used against respiratory problems, such as cough, bronchitis, and colds. They have also been used against digestive difficulty, such as dysentery, gastritis, and flatulence. The bark of the tree is an anti-diuretic, and anti-inflammatory properties have been attributed to both the leaves and the root.(1) hipertension(3) tos(4) The leaves, bark, and fruit can be used for sollen glands associated with a cold, cough with phlegm, and to lower blood pressure. It is also takens as a diuretic.(5) sudorificos(7) para el pelo(8)

distribution

Found in temperate forests, especially the Central Valley of Costa Rica.(1)

sources

1:Lieberman
/2:El uso de algunas plantas medicinales en costa rica p75
/3:curanderismo tradicional del costarricense p 102
/4:curanderismo tradicional del costarricense p 179
/5:Jardin de plantas Medicinales
/6:Plantas Medicinales de Puerto Rico p254, 255
/7:curanderismo tradicional del costarricense p 59
/8:curanderismo tradicional del costarricense p 160
/9:Jardin Dominga
/10 UGA San Luis Valley Medicinal Plant Garden

Senna reticulata

Fabaceae

spanish name
Saragundí(1,2,3) Sarangundí(4)

english name
Senna (3)

costa rican uses

laxante, baja fiebre, artritis(1)

origin

Am. Tropical(1),
Costa Rica (3)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Jardin Dominga
/3 UGA San Luis Valley Medicinal Plant Garden
/4:La utilidad de las plantas medicinales en Costa Rica

Smilax sp.

Smilacaceae

spanish name

Zarzaparilla (4), Bigger
Zarzaparilla(1)
cuculmeca(2,3,4)
raiz de chino, chieese rott(3)

costa rican uses

Boiling the root of the plant is said to combat diarrhea and reduce fevers.(2)

sources

1:Jardin Dominga
/2:Jardin de plantas Medicinales
/3:El uso de algunas plantas medicinales en costa rica p29
/4:La utilidad de las plantas medicinales en Costa Rica

Solanum mammosum

Solanaceae

spanish name
Pichichío (3,4),
nicaragua:chichigua (4)

english name
Nipplefruit (3)

costa rican uses

Sinusitis(1)

origin

Am. Tropical(1), america(2), Costa Rica (3)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:El uso de algunas plantas medicinales en costa rica p63
/3 UGA San Luis Valley Medicinal Plant Garden
/4:La utilidad de las plantas medicinales en Costa Rica

Sonchus oleraceus

Asteraceae

spanish name	**english name**
lechuguilla(1,2), Falso diente de léon(3,5,6,8), Cerrajilla (7)	Common Sowthistle (6), Dandelion (8)

costa rican uses

hemorragia vaginal(1) ulceras o llagas(2) Traditionally consumed to combat with liver problems, menstrual irregularities, urinary tract infections, stomachaches, and intestinal gas. Applied externally as an anti-inflammatory.(3) Used to help liver problems (8)

distribution

Cosmopolitan distribution. Commonly found in pastures, sunny patches, and on roadsides(3)

sources

1curanderismo tradicional del costarricense p 97
/2:curanderismo tradicional del costarricense p 158
/3:Lieberman
/4:Plantas Medicinales de Puerto Rico p273
/5:Jardin Dominga
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica
/8:Jardin de plantas Medicinales

Tagetes erecta

Asteraceae

sources

Interview with Jorge Arce Portuguez, and Hernán Rodríguez Navas, May 2005

Tagetes lucida

Asteraceae

spanish name
hierba de San Juan(1), Pericon(2),Pericón(3)

english name
Sweet-scented Marigold (3)

costa rican uses

gastralgia(1)

origin

Mesoamérica(1)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Jardin Dominga
/3 UGA San Luis Valley Medicinal Plant Garden

Tanacetum parthenium

Asteraceae

spanish name	**english name**
Altamisa(1,2,3,4)	Feverfew(1,2,4)

sources

/1:Jardin Dominga
/2 UGA San Luis Valley Medicinal Plant Garden
/3:La utilidad de las plantas medicinales en Costa Rica
/4:San Luis Valley Survey 2004

Taraxacum officinale

Asteraceae

spanish name	**english name**
Diente de León (1,2,3,4)	Common Dandelion (1,2,4)

sources

1:Jardin Dominga
/2:El uso de algunas plantas medicinales en costa rica p31
/3:San Luis Valley Survey 2004
/4 UGA San Luis Valley Medicinal Plant Garden

Thymus vulgaris

Lamiaceae

spanish name	english name
Tomillo(1,2,3,4)	Thyme(1,2,3)

costa rican uses

Thyme is used to fight cougs, asthma, and intestinal parasites. This culinary herb is thought to help strengthen the heart, stomach, or kidneys.(2)

other uses

Used in Europe to help strengthen the circulatory and nervous systems. Also used to improve digestion, and to combat respiratory problems.(3)

origin

Native to the Mediterranean(3)

distribution

Native to the Mediterranean, but cultivated in temperate areas worldwide.(3)

sources

1:El uso de algunas plantas medicinales en costa rica p83
/2:Jardin de plantas Medicinales
/3:Lieberman
/4:La utilidad de las plantas medicinales en Costa Rica

Triumfetta lappula

Malvaceae, also placed in Tiliaceae

spanish name	**english name**
mozote de caballo(1,3,4)	Triumfetta(1,3)

costa rican uses

using the bark of the plans is said to be effective against hangovers, gas pains, and stomach pains.(1) The bark of T. semitriloba is said to refresh the stomach, to be effective against stomach or intestinal ulcers, to ease gastritis, and to go good for the liver and kidneys. The barks of both species are said to be effective against sores in the mouth.(3) Diurético, refresca estómago, diarreas, resfríos(4)

sources

1:Jardin de plantas Medicinales
/2:Plantas Medicinales de Puerto Rico p309
/3:Lieberman
/4:Maria Ruth Martinez-Rodriguez: medicinales de EARTH

Triumfetta semitriloba

Malvaceae, also placed in Tiliaceae

spanish name	**english name**
Mozote de caballo (1,2,4,5)	Triumfetta(1,4), Burrbark (5)

costa rican uses

The bark of T. semitriloba is said to refresh the stomach, to be effective against stomach or intestinal ulcers, to ease gastritis, and to go good for the liver and kidneys. The barks of both species are said to be effective against sores in the mouth.(4)

origin

Costa Rica (5)

sources

1:Jardin Dominga
/2:San Luis Valley Survey 2004
/3:Plantas Medicinales de Puerto Rico p309
/4:Lieberman
/5 UGA San Luis Valley Medicinal Plant Garden

Uncaria tomentosa

Rubiaceae

spanish name	**english name**
Uña de Gato (1,2), Rangallo(2), Uña de igre(2)	Cat's Claw(1)

origin

Costa Rica

sources

/1 UGA San Luis Valley Medicinal Plant Garden
/2:La utilidad de las plantas medicinales en Costa Rica

Urera baccifera

Urticaceae

spanish name
Ortiga(1,2,5,6,7)

english name
Scratchbush(6)

costa rican uses

reumatismo(1) antiinflamatorio(2) Medicinalmente se ha empleado como diurético, rubefaciente, vejigatorio, y en casos de fiebre, gonorrea, malaria, artritis y reumatismo.(4) Lactancia(5)

origin

Mexico- Brasil(2), De México a Sur America y Las Antillas.(4), Costa Rica (6)

distribution

Valle Central y ambas vertientes. Elevación de 10-900 m.(4)

sources

1:curanderismo tradicional del costarricense p 169
/2:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/3:Plantas Medicinales de Puerto Rico p397
/4:http://darnis.inbio.ac.cr/FMPro?-DB=UBIpub.fp3&-lay=WebAll&-Format=/ubi/detail.html&-Op=bw&id=1470&-Find
/5:curanderismo tradicional del costarricense p 116
/6 UGA San Luis Valley Medicinal Plant Garden
/7:La utilidad de las plantas medicinales en Costa Rica

Urtica dioica

Urticaceae

spanish name
Ortiga(1,2,3)

english name
Stinging Nettle (2)

sources

/1:Jardin Dominga
/2 UGA San Luis Valley Medicinal Plant Garden
/3:La utilidad de las plantas medicinales en Costa Rica

Verbena litoralis

Verbenaceae

spanish name

Vervain(5), verbena(1,2,3,4,6,7,8,9,10,11, 12)

english name

Vervain(3,7,9,11), Verbena(5)

costa rican uses

dierrea(1) lombrices(2) For menstrual problems flowers are used. The entire plant is used to fight fevers, diarrhea, hepatitis, and to heal wounds.(3) diarrea(4) For menstrual problems flowers are used, the entire plant is used to fight fevers, diarrhea, hepatitis, and to heal wounds.(5) para el pielo(6) dolor de estomago(8)

origin

Native throughout the Americas(3), Costa Rica (11)

distribution

Throughout the Americas(3)

sources

1:curanderismo tradicional del costarricense p 72
/2:curanderismo tradicional del costarricense p 122
/3:Lieberman
/4:curanderismo tradicional del costarricense p 70
/5:Jardin de plantas Medicinales
/6:curanderismo tradicional del costarricense p 161
/7:El uso de algunas plantas medicinales en costa rica p80
/8:curanderismo tradicional del costarricense p 82
/9:Jardin Dominga
/10:San Luis Valley Survey 2004
/11 UGA San Luis Valley Medicinal Plant Garden
/12:La utilidad de las plantas medicinales en Costa Rica

Zea mays

Poaceae

spanish name

Maíz(2,4,5,6,7,9,10,11)
Pelo de maiz(1,3)

english name

Corn(10)

costa rican uses

rekumatismo(1) hemorragia vaginal(2) riñones(3) affeciones del higado(4) para calmar la tos(5) estilos en dolor de riñones(6) aperitivos, estimulantes del apetito(7) lactancia(9)

origin

América tropical(6)

sources

1:curanderismo tradicional del costarricense p 169
/2:curanderismo tradicional del costarricense p 97
/3:curanderismo tradicional del costarricense p 175
/4:curanderismo tradicional del costarricense p 106
/5:curanderismo tradicional del costarricense p 180
/6:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/7:curanderismo tradicional del costarricense p 47
/8:Arvigo: Rainforest Remedies p59Sources of Information
/9:curanderismo tradicional del costarricense p 116
/10:San Luis Valley Survey 2004
/11:La utilidad de las plantas medicinales en Costa Rica

Zebrina pendula

Commelinaceae

spanish name

Cucaracha(3,6,9), milagro(2,4,5,6,8)

english name

Wandering jew(9)

costa rican uses

menstruacion(2) anthemorrágico, contra colitis y diabetes.(3) neuralgias faciales(4) reumatismo(5) hamorragia vaginal(7) lactancia(8) used in a tea to help kidney pains, colitis, diabetes, and stop hemorrhaging(9)

sources

1:Plantas Medicinales de Puerto Rico p371
/2:curanderismo tradicional del costarricense p 125
/3:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/4:curanderismo tradicional del costarricense p 87
/5:curanderismo tradicional del costarricense p 168
/6:El uso de algunas plantas medicinales en costa rica p47
/7:curanderismo tradicional del costarricense p 97
/8:curanderismo tradicional del costarricense p 116
/9:Jardin de plantas Medicinales

Zingiber officinale

Zingiberaceae

spanish name	**english name**
Jengibre(1,2,4,6,7,8,9,10,11,12)	Ginger(2,6,7,11)

costa rican uses

contra tos y afecciones de garganta(1) Used against a wide variety of maladies, including stomachache, respiratory difficulties, rheumatism, and fever. Also applied topically to relieve rheumatism, arthritis, headache, and spinal aches.(2) dolor de garganta(4) the root of this plant has been prescribed for travel sickness. It is also used in cosmetics, cooking and to make types of alcohol.(6) reumatismo(8) dolor de estomago(9)

origin

sureste de Asia (1),
India and China(2)

distribution

Native to India and China, but now cultivated throughout the tropics and sub-tropics.(2)

sources

1:Maria Ruth Martinez-Rodriguez: medicinales de EARTH
/2:Lieberman
/3:Arvigo: Rainforest Remedies p77
/4:curanderismo tradicional del costarricense p 83
/5:Plantas Medicinales de Puerto Rico p27, 53
/6:Jardin de plantas Medicinales
/7:Jardin Dominga
/8:curanderismo tradicional del costarricense p 169
/9:curanderismo tradicional del costarricense p 81
/10:San Luis Valley Survey 2004
/11 UGA San Luis Valley Medicinal Plant Garden
/12:La utilidad de las plantas medicinales en Costa Rica

Appendix C
Proposed *Cuadro Basico* and the San Luis Valley medicinal plant garden

Species in
Proposed *Cuadro Basico*
And
UGA San Luis Valley Medicinal Plant Garden

Genus Species Name	Family Name
Aloe vera	Liliaceae
Ambrosia cumanensis	Asteraceae
Argemone mexicana	Papaveraceae
Artemisia absinthium	Asteraceae
Borago officinalis	Boraginaceae
Brugmansia suaveolens	Solanaceae
Buddleja americana	Loganiaceae
Calendula officinalis	Asteraceae
Chaptalia nutans	Asteraceae
Chenopodium ambrosioides	Chenopodiaceae
Costus spicatus	Costaceae, also placed in Zingiberaceae
Croton draco	Euphorbiaceae
Cymbopogon citratus	Poaceae
Cymbopogon nardus	Poaceae
Equisetum bogotense	Equisetaceae
Eryngium foetidum	Apiaceae
Hamelia patens	Rubiaceae
Hibiscus sabdariffa	Malvaceae
Jatropha gossypiifolia	Euphorbiaceae
Justicia pectoralis	Acanthaceae
Justicia tinctorea	Acanthaceae
Kalanchoe pinnata	Crassulaceae
Lippia alba	Verbenaceae
Lippia dulcis	Verbenaceae
Lippia graveolens	Verbenaceae
Malva parviflora	Malvaceae
Matricaria recutita	Asteraceae
Melissa officinalis	Lamiaceae
Mentha citrata	Lamiaceae
Mentha x piperita	Lamiaceae
Momordica charantia	Cucurbitaceae
Morinda citrifolia	Rubiaceae
Neurolaena lobata	Asteraceae
Ocimum basilicum	Lamiaceae
Ocimum micranthum	Lamiaceae
Petiveria alliacea	Phytolaccaceae
Pimenta dioica	Myrtaceae
Plantago major	Plantaginaceae

Quassia amara	Simaroubaceae
Rosmarinus officinalis	Lamiaceae
Rumex crispus	Polygonaceae
Ruta chalapensis	Rutaceae
Salvia officinalis	Lamiaceae
Sambucus mexicana	Caprifoliaceae
Senna reticulata	Fabaceae
Smilax spinosa	Smilacaceae
Solanum mammosum	Solanaceae
Sonchus oleraceus	Asteraceae
Tagetes lucida	Asteraceae
Tanacetum parthenium	Asteraceae
Taraxacum officinale	Asteraceae
Thymus serpyllum	Lamiaceae
Triumfetta semitriloba	Malvaceae, also placed in Tiliaceae
Uncaria tomentosa	Rubiaceae
Urera baccifera	Urticaceae
Urtica dioica	Urticaceae
Verbena litoralis	Verbenaceae
Zingiber officinale	Zingiberaceae

Species in
Proposed *Cuadro Basico*
And Not In
UGA San Luis Valley Medicinal Plant Garden

Genus Species Name	**Family Name**
Acnistus arborescens	Solanacea
Amaranthus viridis	Asteraceae
Bidens pilosa	Asteraceae
Brugmansia candida	Solanaceae
Caesalpinia pulcherrima	Fabaceae
Capsicum frutescens	Solanaceae
Carica papaya	Caricaceae
Cassia grandis	Fabaceae
Cassia reticulata	Fabaceae
Catharanthus roseus	Apocynaceae
Cecropia obtusifolia	Cecropiaceae
Chrysanthemum parthenium	Asteraceae
Coriandrum sativum	Apiaceae
Croton niveus	Euphorbiaceae
Erythrina lanceolata	Fabaceae
Eucalyptus globulus	Myrtaceae
Gossypium hirsutum	Malvaceae
Ilex paraguariensis	Aquifoliaceae
Linum usitatissimum	Linaceae
Lycopersicon esculentum	Solanaceae
Malva sp	Malvaceae
Malvaviscus arboreus	Malvaceae
Manihot esculenta	Euphorbiaceae
Maranta arundinacea	Marantaceae

Matricaria chamomilla	Asteraceae
Mentha sp	Lamiaceae
Musa paradisiaca	Musaceae
Nicotiana tabacum	Solanaceae
Nopalea coccinellifera	Cactaceae
Psidium guajava	Myrtaceae
Raphanus sativus	Brassicaceae
Ricinus communis	Euphorbiaceae
Salix humboldtiana	Salicaceae
Tagetes erecta	Asteraceae
Triumfetta lappula	Malvaceae, also placed in Tiliaceae
Zea mays	Poaceae
Zebrina pendula	Commelinaceae

Species in
UGA San Luis Valley Medicinal Plant Garden
And Not In
Proposed *Cuadro Basico*

Genus Species Name	**Family Name**
Capsicum annuum	Solanaceae
Dicliptera Unguiculata	Acanthaceae
Dieffenbachia oerstedii	Araceae
Echinacea purpurea	Asteraceae
Elettaria cardamomum	Zingiberaceae
Hypericum perforatum	Clusiaceae
Nepeta cataria	Lamiaceae
Passiflora biflora	Passifloraceae
Stevia rebaudiana	Asteraceae
Symphytum officinale	Boraginaceae
Vernonia patens	Asteraceae
Vitis tiliifolia	Vitaceae
Witheringia solanacea	Solanaceae