

explain the high overall visitation rate to non-specific flowers. We suggest that future studies quantify visitation rate per flower, to more rigorously compare the ability of different flower morphologies to attract pollinators of various kinds. It would also be useful to assess the out-crossing potential of visits by different pollinator types by quantifying how frequently they move among conspecific, rather than heterospecific flowers.

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LITERATURE CITED

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A survey of medicinal and other useful plants at Cuerici Reserve, Cerro de la Muerte

ARTHUR J. KEHAS

Abstract: The increasing influence of developed countries in the neotropics is leading not only to the destruction of the rainforests but also to the loss of valuable information about the use of plants. I attempted to document and classify as many of the useful plants found in the Cerro de la Muerte region as was possible. In total, I described 27 plants in three general categories: medicinal, edible, and other. Many plants were found in the primary forest of the Cuerici Reserve, intensifying the need to preserve the little remaining primary oak forest at high elevations in Costa Rica.

Key Words: Alternative medicine, medicinal plants, plant use, rainforest conservation

INTRODUCTION

The European colonization of Costa Rica and the rest of the neotropics led to the extinction of many indigenous cultures. Although the new settlers adopted many habits and traditions from these peoples, much has been lost. Today the exploitation of global markets is increasing the influence of developed countries in the neotropical region and weakening the influence of more traditional cultures. As these cultures decline, much information is lost.

In this study, I sought to record and classify certain plants and their uses in the Cerro de la Muerte region, as described to me by a local inhabitant, Carlos Solano. I attempted to conduct as complete a survey as possible to thoroughly document and preserve this knowledge, for as the people in this region become increasingly "modernized," this information often can be lost.

METHODS

To gather information on the use of plants at Cerro de la Muerte, I went on two walks in disturbed habitats and primary, high elevation oak forest with Carlos Solano. Sr. Solano pointed out various plants and explained their uses. His family has worked the land in this region for three generations and has been instrumental in

transferring much of that land into the Cuerici Reserve. Growing up in the forest, Sr. Solano has accumulated this information from his father and from his experience in high elevation wilderness survival during numerous, multi-day expeditions in areas without trails or opportunities to otherwise obtain provisions.

RESULTS

Information gleaned from Carlos Solano is presented in Tables 1 and 2.

DISCUSSION

Although science has yet to validate the effectiveness of many of these plants, their continued use over many years suggests a degree of efficacy. However, the tradition of using most of these plants is being lost as cultural changes increase. Thatch roofs have been replaced by metal ones, and pipes of canoa have been traded for pipes made of plastic or metal. Furthermore, as the influence of western medicine grows, the use of herbal medicine declines. As the use of these plants is discontinued, valuable information is forgotten. Therefore, efforts to document these medicines are essential to their preservation. Unfortunately, this study grossly underestimates the true diversity of useful plants in the Cerro de la Muerte region.

TABLE 1. List of medicinal and edible plants and their uses. "Understory" refers to primary oak forest at the Cuerici Reserve, Costa Rica.

Family (and genus, species where known)	Common Names	Habitat	Uses	Parts Used	Method of Administration
Amaryllidaceae (Bomarea)		Understory	Treats white skin blotches from sun exposure.	Tuber	Cut tuber and apply to discoloration.
Asteraceae (Cirsium subcoriaceum)	Thistle, Cardo	Open spaces, understory	Food	Leaf bud	Use in salads.
Asteraceae (Taraxacum)	Dandelion, Diente de leon	Open spaces, understory	Treats pains in the liver, especially resulting from consumption of fatty or spicy foods.	Leaf	Use raw leaf in salads or to make a tea.
Clusiaceae (Clusia)		Understory	Treats nervousness and insomnia.	Leaf	Make a tea from the leaf.
Cucurbitaceae (Sechium)	Wild cucumber	Understory	Water (when other sources unavailable)	Stem	Slice stem open and drink water.
Cyantheaceae	Tree fern	Understory	Treats burns and skin irritations.	Fiddlehead	Slice fiddlehead into strips and apply to affected area. Secure with a wrap.
Ericaceae	Grapes of the Mountain	Edge / Understory	Food	Fruit	Fruit is edible; use in marmalades.
Lamiaceae	Mountain mint	Edge / Understory	Soothes the stomach and relaxes.	Leaf and unopened flowers	Make a tea from the leaves and / or unopened flowers.
Lycopodiaceae (Lycopodium)	Club moss	Edge / Understory	Antibiotic	Spores	Use dry strobili (terminal spikes) or pick fresh strobili and allow to dry in the sun. Then, remove spores and apply directly to wound or cut.
Melastomataceae	All melastomes	Variable	Food	Fruits	Eat fresh.
Onagraceae (Fuchsia microphylla)	Fuchsia	Edge / open spaces	Nutritional drink (high in Vitamin C)	Fruits	Allow fruits to soften and ripen. Boil fruits in water and strain to remove seeds and pulp.
Oxalidaceae (Oxalis)		Edge/ understory	Food	Leaves and stems	Use in salads. Adds a bitter taste (from oxalic acid).
Plantaginaceae (Plantago)	Plantain	Edge / open spaces	Laxative / coagulant	Seeds	Seeds must be dry enough to come off with a pass of the hand. Gather seeds into palm, press with fingers, and gently blow to remove husks. As a laxative, soak seeds in water for one day. Drink liquid with seeds. As a coagulant, apply dry seeds directly to cut.

TABLE 1 (continued). List of medicinal and edible plants and their uses. "Understory" refers to primary oak forest at the Cuerici Reserve, Costa Rica.

Family (and genus, species where known)	Common Names	Habitat	Uses	Parts Used	Method of Administration
Rosaceae (Rubis glaucus)	Blackberry	Edge / open spaces	Treats sores in the mouth. Also used to replenish the body after diarrhea.	Fruits or roots	To treat sore in the mouth, make a paste of the fruit and add much salt. Apply to sores. To replenish the body, cook the roots and rice together. Strain, and drink the liquid.
Solanaceae	Barengena	Edge / understory	Treats problems with urination due to enlarged prostate. Also treats vaginal infections.	Roots	To treat both categories of symptoms, boil roots in water, strain, and drink the liquid.
Urticaceae	Stinging nettle	Edge / understory	Used as a general blood detoxifier. Also used to treat arthritis.	Leaves or needles	As a detox, make a tea out of the leaves. Or, when plant is young and tender, add to salads. To treat arthritis, sting the skin above the inflicted joint once or twice. Repeat every few days or as necessary.
Verbenaceae (Verbena)	Verbena	Edge / open spaces	Treats digestive problems leading to vomiting. Also used as a liver detox.	Leaves	To treat vomiting due to food consumption or to detoxify the liver, eat fresh or make a tea from the leaves. Good to eat with meat or to use as a preventative when freshness of food is doubtful.
Winteraceae (Drimys winteri)		Edge / understory	Anaesthetic	Leaves	To relieve pain from insect bites or bruises, crush leaves and apply to afflicted area. Wrap with cloth bandage and add a few drops of water. Very powerful. Do not use in open wounds as it will irritate the cut.
	Algodoncillo	Edge / understory	Coagulant	Leaves	Gently pull leaf apart longitudinally to expose fibers in several places. Wrap cut with as many leaves as necessary and cover with a bandage. Fibers contain a coagulant.
	Fruiting vine	Understory	Food	Fruit	Eat fresh.
	Gordo lobo	Edge / understory	Relaxant	Stem, leaves, flower	Use any or all listed parts in a tea. Boil in water, strain, and add milk.
	Jaboncillo	Edge / open spaces	Appetite suppressant	Stem, leaves, flower, fruit	Make a lozenge out of any part or parts.
	Hierba de mujer, Women's herb	Edge / understory	Treats symptoms of premenstrual syndrome. Caution: also is an abortive.	Leaves and stem	Use stems and leaves in tea.

TABLE 2. List of non-medicinal, non-food plants and their uses. Information obtained for Cuerici Reserve, Costa Rica.

Family (and genus, species where known)	Common Names	Habitat	Uses	Parts Used	Method of Use
Araceae (Anthurium)		Understory	Used to cook meat.	Leaf	Wrap meat in leaf. Dig a hole, place wrapped meat in hole, cover with a layer of soil. Build a fire on top.
Betulaceae (Alnus acuminata)	Alder	Forest	Construction, timber, tanning, wood protectant, matchsticks, shoe forms	Trunk, limbs, bark	As a wood conditioner, boil bark in water and apply liquid to wood. Wood carved to make shoe forms.
Hydrophyllaceae	Ortiga gigante	Edge / understory	Used to make thatch roofs.	Leaves	Leaves are overlapped to create a thatched roof.
	Canoa	Understory	Used to transport water.	Trunk	Trunk can be easily hollowed and used as a pipe to transport water.
	Jaboncillo	Edge / open spaces	Used to wash clothes.	Leaves	Crush leaves and wrap in cloth. Scrunch in water to develop suds.

Firstly, my information comes from only one source. Talking to more people would increase the quantity of information gleaned. It is a matter of urgency to actively seek out as much information from as many sources as possible. Carlos Solano believed that much of his information stemmed from indigenous traditions. However, he did not know many of the details or the extent of indigenous use. It is likely that, because of their greater reliance on the land for medicine, indigenous peoples could have possessed a more comprehensive encyclopedia of plants. However, whether such information is still available from indigenous informants is unclear.

It is evident that useful plants are found in both disturbed and primary forest, but the full spectrum of useful plants is available only when both primary forest and

disturbed areas are available to people. The area I sampled is unique in that it is situated in and near the Cuerici Reserve. However, for most inhabitants of high elevation areas, access is limited to secondary forest or no forest at all. Thus, it is critical that the remaining primary forest is conserved, and a more balanced land-use practice is developed.

Additionally, the market demand for natural treatments is growing, raising the dollar value of medicinal plants. Thus, the value of preserving these plants and their habitats increases. This helps in assigning a financial value to ecological communities, which can aid in conservation. Furthermore, only a small fraction of the plants with possible medicinal value have been tested. Thus, a great potential to discover novel therapies exists.