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Touch Me Not Plant: A Hermeneutic – Semiotic Phenomenology

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Abstract

As Ilokanos call this herb and sometimes consider it an ornamental plant, Bain-bain has many uses. It has moved from its use as a fence to the center of Ilocanos' life, literally around which revolves their social, cultural, and economic activities. This hermeneutic phenomenological study aimed to examine the lived experiences of the Ilocanos on the Mimosa pudica (makahiya). The study focused on Ilocanos' practices, beliefs, a deeper understanding of the plants, and their medicinal value. This study delves further into the symbolical interpretation, the more substantial effect on sociocultural development, the cultural knowledge on the sensitivity of the makahiya leaves, and the significant contributions to the teaching-learning process to preserve culture and identity. A total of 15 respondents/informants participated in the survey. Additional information was obtained from personal interviews with the members of the community, who are the most knowledgeable elders. Results revealed that Ilocano treats illnesses like ulcers, skin problems, and inflamed liver. It is also used as an antioxidant to replenish the loss of nutrients due to diarrhea. Moreover, the makahiya plant is used for medicinal purposes and is associated with different emotions or parts of life. It was deemed that makahiya was an emblem of femineity and freedom.

Keywords: Mimosa pudica, hermeneutic, semiotic, lived experiences, Ilokano practices, and beliefs.

1. Introduction

Philippine society is a unique blend of diversity and homogeneity. Filipino has become emblematic of cultural unity and socio-economic progress. Progress has become a significant part of the change in Philippine society. Modernity has always been associated with improvement (Wagner, 2012). Modernity has led to liberating a person from ignorance, and in doing so, thoughts and attentions are directed toward the transformation of a scientific, rationalized society capable of justifying any position it may adopt. Therefore, culture becomes a framework, a paradigm for perceiving reality. It functions as a standard for comprehending or evaluating a particular viewpoint. Never before has there been a more pressing need to discover, understand, conserve, and sustainably use essential plant resources for the benefit of humanity. (Missourri Botanical Garden, 2008).

The Philippines is considered rich in a culture wherein different facets of life are considered. Common traditional knowledge among Filipinos is the utilization of plants. Many native communities use these resources as a source of nutrition and a cure for common illnesses or diseases (Docot et al., 2022). Herbal medicines are considered the oldest form of health care for humanity. Prior to the development of modern medicine, the traditional systems of medicine that have evolved over the centuries within various communities are still maintained as a great traditional knowledge base in herbal medicine (Mukherjee & Wahil, 2006).

The essential economic benefits asserted for medicinal plant use in the treatment of a variety of conditions are practical safety and easily available. Moreover, it is an undeniable fact that the

knowledge of indigenous people is invaluable in the present-day context of biodiversity for its sustainable utilization and novel drug development programs (Bosco & Arumugan, 2012).

Studies in the ethnobotany of cultural groups that rely on the oral tradition to pass on traditional medicinal plant knowledge from generation to generation indicate that in addition to the great wealth of knowledge of economically valuable plants, these cultural groups also have an extensive knowledge of economically valuable plants and the traditional techniques used to manage, harvest and conserve these species (Soejarto et al., 2009)

In the Philippines, the plants mainly used among indigenous people were recorded as food plants and used for various other purposes, mainly construction and crafts. Since most indigenous people lived considerably isolated from mainstream society, they heavily relied on natural products for food and construction (Prigge et al., 2005).

One good plant that was given attention in Philippine culture is the “makahiya” plant. Makahiya is scientifically known as Mimosa pudica. It is commonly known in Iloko as Bain-bain and in Tagalog as makahiya. Makahiya is widespread and profuse in the Philippines' open refuse areas. It is a perennial or creeping herb that typically thrives in any type of soil. It is currently being propagated for its unique characteristic, sensitivity. When touched, the compound leaves curl inward and decline, but reopen within minutes. Also known as Humble plant, Shame plant, Sleeping grass, Prayer plant, Touch Me Not, and makahiya (Stuart, n.d.). It derives its prevalent appellation, "makahiya," from the Filipino word for "shame" or "shyness" ("hiya").

Scientifically, thigmotropism is the movement of plants caused by contact stimuli. This mechanosensory response is triggered by the force exerted by water and other cell contents against the plant's cell walls. This mechanism makes Mimosa pudica leaves close. (Ethnobotany of Irular Tribes in Redhills, Tamilnadu, India, 2012)

Gagliano (2014) found that the tested plants stopped closing their leaves after repeated water-dropping, indicating that the makahiya plants realized that the droplets presented no real danger. According to biologists, the plants were able to learn rapidly; acquiring this behavior took only seconds. However, the biologists also conceded that they had not yet determined the precise biological foundation for the learning capabilities of plants. Positively, their findings cast new light on how individuals comprehend the similarities and differences between flora and animals. This should also serve as an effective reminder to refrain from disrupting flora, as it appears that learning is not limited to animals alone. Although there is no concrete evidence as to why touch-me-not plants developed this characteristic, researchers think it might serve as a form of defense for them. Furthermore, it is believed that such rapid movements help the plant dislodge insects that may pose a danger to certain parts of the plant. (http://www.wildturmeric.net/2015/08/mimosa-pudica-medicinal-uses-health-benefits.html?m=1)

The makahiya leaves characteristics can be associated with some essential characteristics of Ilocanos. Bain, hiya, or amor propio (“face” or sense of shame) is a prominent characteristic among traditional Ilocano. The fear of rumor and the desire to avoid the admiration of others are powerful conformity pressures. Ilocanos tend to think hard first before engaging in an act. Moreover, Ilocanos are also known as stingy or kuripot. They tend to value money so much that people see them clutching their money.

The prior research did not address the sociocultural aspects of the plant because it only investigated the botanical aspect and the phytochemical contents of the plant. It encompasses several new dimensions that lately have attracted research attention in other. The "lived experiences of the Ilocanos on Mimosa pudica (Makahiya)" should be explored further to provide a broader understanding of the plant. (Miles, 2017).

This study will contribute to the literature by concentrating on the lived experiences of elderly and young people to provide a better understanding of makahiya as it is defined, experienced, and practiced in a community context. The outcomes/results of this study can aid and support new endeavors in the fields of biological science, chemistry, sociocultural aspects, health, and other allied professions. In addition, the findings of the survey will provide the community members with a clear picture of the socioeconomic effects of the makahiya and increase their understanding of its health effects.

This endeavor will serve as a foundation for the conservation and educational advantages of the makahiya. It also contributes to the Ilocano people's cultural preservation. In addition, the current study will contribute to the literature by concentrating on the lived experiences of old people, including the young, in order to provide a better understanding of makahiya as it is defined, experienced, and practiced in a community context.

The outcomes/results of this study can aid and support new endeavors along sociocultural dimensions for other allied professions. In addition, the findings of the research will provide community members with a clear picture of the socioeconomic impact of the makahiya and subsequently increase their understanding of the cultural context.

2. Objectives of the Study

This hermeneutic phenomenological study aimed to examine the lived experiences of the Ilocanos on the Mimosa pudica (makahiya). The study focused on Ilocanos' practices, beliefs, a deeper understanding of the plants, and their medicinal value. This study delves further into the symbolical understanding, the more profound effect on sociocultural development, the cultural knowledge on the sensitivity of the makahiya leaves, and the significant contributions to the teaching-learning process to preserve culture and identity.

3. Literature Review

3.1 Makahiya as a Medicinal Plant

Very few people, especially those who reside in cities, do not believe in the value and efficacy of herbal plants that are abundant in this country as substitutes for modern packaged or bottled pharmaceuticals in these days of sophisticated medicine and the new method of producing so many different types of medicine. These plants are used to make herbal teas that are applied to the body and used to cleanse ulcers and incisions. Asthma, dysentery, skin diseases, cancer, ulcers, sores, gastrointestinal issues, colds, and other pulmonary diseases can be treated with these herbs. Some fruits are useful for treating diseases such as diabetes, high blood pressure, respiratory disorders, chest pain, and hemorrhage. Some leaves are used to treat wounds and fractured bones, among other ailments. Herbal plants, trees, and flora can be used promptly in emergency situations, particularly when outside of town and no modern medication is available. People who cannot afford the high prices of modern medications from pharmacies are turning to botanicals that can be found in the backyards of human residences and can be obtained for free. (http://www.herbal medicine.html.)

One of the earliest therapies that man discovered was treatment using plants. When sick, the unreasoning animals often look for herbs and instinctively seek preventive and healing elements. As intelligent being superior to animals, man observed this instinct in them and found many healing properties in plants.

There are several traditional medicine healers in Ilocos Sur who are well-versed in the pharmacological knowledge of medicinal plants. (de Peralta, et.al, 2022) which indicates that traditional medicine and medicinal plants are options for curing diseases.

Mimosa pudica linn, also known as "makahiya" in Filipino and "Babain" in Iloko, is a popular ornamental plant due to the fact that its leaves coil up in response to contact, heat, or breeze. The seeds and other portions of the Mimosa pudica linn plant contains mimosine, and scientific investigations have shown that extracts of the plant are a moderate diuretic, inhibit duodenal contractions similarly to atropine sulphone, promote nerve regeneration, and reduce menorrhagia. The roots and foliage are commonly used for medicinal purposes. Bitter, astringent, acrid, soothing, vulnerary, alexipharmic, resolvent, diuretic, antispasmodic, emetic, constipating, and febrifuge are some of the properties of the roots. They are beneficial for pitta imbalances, leucoderma, vaginoplasty, metropathy, ulcers, dysentery, inflammations, searing sensation, hemorrhoids, jaundice, asthma, fistula, smallpox, strangury, spasmodic, affections, and fevers (Pande & Pathak, 2010). According to reports, root extracts are a potent emetic. Asthma, expectorant, urinary complaints, glandular enlargement, sore larynx, and hoarseness are treated with decoction or infusion of the leaves (Estrella, 1983; Racadio, 2008). Some studies indicate that the roots are used in homeopathic remedies for a variety of conditions, including urinary and vaginal infections, asthma, inflammations, gastroenteritis, skin irritation, neurological disorders, and rheumatoid arthritis symptoms (Miley, n.d.). In China, India, Trinidad, Panama, Haiti, and Venezuela, among other Southeast Asian nations, research is being conducted on the therapeutic

effects of Mimosa pudica linn. For the treatment of UTIs in the Philippines, indigenous remedies and treatments utilizing plant roots are most prevalent in La Union and its environs.

According to Pande and Pathak's (2010) research, the roots of Mimosa pudica Linn have significant medicinal value. Based on the results of pharmacognostic and phytochemical studies, including qualitative chemical examinations of the plant's roots, they reached their conclusions. Chemical analysis revealed the presence of flavonoids, phytosterol, alkaloids, amino acids, tannins, glycosides, and fatty acids.

3.2 Makahiya and its Socio-cultural Aspect

Everywhere in the Philippines, makahiya (Mimosa pudica) grows in the natural, so it is possible that at least one person has "played" with this plant. Named after the Tagalog word for shame or chagrin, the makahiya is renowned for its leaves' ability to coil when grazed with the index fingertip. It is a native of South and Central America, despite its widespread distribution in the Philippines. Possibly even more intriguing than its peculiar response to contact is its apparent capacity to learn, and how this may alter our understanding of how plants perceive peril.

Two investigations that were completed and released in 2014 indicated that the makahiya had the ability to acquire habits and remember past experiences. In the first research, a team of Australian and Italian biologists irrigated makahiya plants grown in a laboratory setting. As soon as the plants realized that the water droplets did not represent a threat, they stopped closing their leaves around themselves. In a matter of seconds, the plants were able to absorb and remember this knowledge for a period of two months, as stated by the researchers. In addition to this, they displayed this capacity in both well-lit and low-lit environments. This demonstrates that makahiya are capable of acquiring knowledge independent of the setting in which they are raised.

The second study, which was carried out by researchers in Costa Rica, focused on makahiya plants that were grown in grasslands or along roadsides and were exposed to sunshine. The researchers observed that as time went on, the plants responded less and less to the non-damaging stimulus that was used to hit the leaves of the plants repeatedly. As a result, the plants reopened their leaves more quickly and only partly closed their leaves. The researchers think that after the plants realized they were not in danger, they made the conscious decision to devote less energy to protecting themselves from potential threats. The researchers found that the plants' responses improved whenever they used a different stimulus. This demonstrated that the first shift in their behavior was not solely the product of tiredness as the previous explanation suggested. (San Francisco, the year 2020)

This present research will add to the existing body of knowledge by concentrating on the lived experiences of elderly people, including those of young people, with the goal of giving a better understanding of makahiya as it is defined, experienced, and practiced in the context of a community. The conclusions and findings of this study have the potential to aid and promote new endeavors in the area of biological science, chemistry, socio-cultural elements, and health, as well as other associated professions. Additionally, the results of the research will offer the people of the community with a clear image of the socio-economic impact of the makahiya, which will, in turn, strengthen their awareness of the consequences of the makahiya on health-related issues.

4. Methodology

This study employed qualitative research design, specifically hermeneutic-semiotic phenomenology. This research explored the observed practices and the scientific knowledge on the sensitivity of the makahiya leaves, which focused on Ilocanos practices, beliefs, a deeper understanding of the plants, and their medicinal value, as well as delves further into the symbolical understanding, the more significant effect to sociocultural development, the cultural knowledge on the sensitivity of the makahiya leaves.

Participants of the study were 15 residents of Ilocos Sur that are familiar with the characteristics of Mimosa pudica (makahiya plant). Purposive sampling was used.

Thematic analysis was utilized for data analysis. The researcher immersed themselves in the data by repeatedly perusing the narratives and then creating the profiles. The next stage was to identify similar topics and categorize them accordingly. Then, the researcher codified the data by identifying themes among the categories. In addition to discrepancies from the literature, any emergent motifs not found in the literature are described.

Interviews were employed as the data collection approach. A semi-structured interview guide served as the prime data collection source. A copy was provided to participants who served as an aide memoire during the interview.

Permission was sought from officials of the place where identified respondents lived. Once the study sample/participants are identified, a schedule of interviews will be constructed. Participants were informed of the purpose of the study and asked to sign a consent form. Participants were informed that the tapes of the interviews would be held confidential and would only be heard by a third-party transcriber of the tapes. The researcher documented observations of the physical and emotional behaviors of the participants.

The study was conducted in accordance with appropriate research ethics protocols. The participants were instructed to provide their permission by signing a formal document and were guaranteed that their identities would remain anonymous.

5. Results and Discussion

This section presents the narrative and reflection papers of the 15 participants with content analysis and discussion.

5.1 Ilocano practices, beliefs, knowledge, and the medicinal value of Mimosa pudica (makahiya)

Before modern medicines have been introduced to this kind of practice in the Philippines, Filipino early ancestors especially the Ilocanos engaged in traditional healing (Berdon et al., 2016). The informants are one with the conclusion that the “bain-bain” has many uses. It is used as a medicinal plant, ornamental plant and a symbol of a native Ilocana.

“Daytoy a mula ket naisangsangayan, ket adda sabsabalia kababalin na nga mangipakpakita iti langa ni Ilockana. Kasla maysa a dayag a raraemen ngem adda ti kabalin na nga managbabain ngem nungka ta adda met pagtangsit na nu maikuskuspil ken maabuso”.

This diffusely spreading, half-woody herb that has very sensitive leaves which fold when touched is herbal remedy from nature. Locally known as Bain-bain or Makahiya, the Mimosa pudica is a common weed that grows with branched stems up to 1 meter long, sparingly prickly with numerous deflexed, bristly hairs (Stuart, 2016).

“adu dagiti pakausaran daytoy nga mula nga saan nga ammo dagiti tattao itan. Dagiti nagkakauna ket adu nga saksakit ti pangiyus usaran da”. Adu dagiti nagkakauna nga kapututan nga nu agsakit da ket daytoy a mula ti kanayun nga usaren da”

They have identified Bain-bain as herbal treatment for flu, fever and cough. The Ilocanos use this by boiling the roots of the weed and consumed by the patients until the symptoms of illnesses subside. According to Stuart (2016), studies have suggested antibacterial, antidepressant, and anticonvulsant properties among the other medicinal properties of the Bainbain or Makahiya.

Another informant noted that the “bain-bain” as he calls it is very effective to heal fresh wounds by extracting the juice of the leaves and roots and applied to the area infected. Further, an informant narrated that boiling the “bain-bain” in a “putik or pot made of clay” is often used as her juice every time she feels sick. An elder informant shares that the “bain-bain” is also use as a healing agent for “kurad” or skin diseases.

“dayta Bain-bain ket adu pakausaran na, makaregreg ti sikog, makaagas ti ulcer ken acidity, ibaga da pay nga pagpatubo ti buok ken ibaga da pay nga nu medyo adda sakit ti utek mo ket makaparelax nu inumen ken irelease na dagiti toxins iti bagi. Dagitoy dagiti nagtaud ti kapanunutan dagiti babbaket ken lallakay idi ugma”.

An informant noted that

“daytoy a mula ket makita laeng iti tamtambak iti taltalon, bangkag ken iti paraangan ngem naklaatak ta nagbalin payen nga ornamental plant. Nakitak nga nakaikabil iti paso nga adda iti tengnga idi garden. Napintas met gayam aglalo diay sabong na ket idi dimteng ti pandemic isu metten iti inaramid mi ken lakay ko ti nagmula ti bain-bain”. Further, another informant shares

that “dayta a mula ket nakabutbuteng, makasiiit, nagrigat a pag-uten ngem kalkalyek nu kua tapno saan a makadangran ngem idi adda nakaibaga kenyak nga makaagas, pinadas ko ket effective”.

Further, another informant shares that

“idi ubbing kami daytoy a mula ket us usaren mi nu aga-ayam kami kadagiti kabaddungalak. Pagbalinen mi a sinan kuruna sami ibalangat kadayjay kadua mi aglalo nu tyempo ti kuaresma”.

Herbal medicine is a component of Ilocano culture that has been handed down through a number of generations and is still actively practiced, particularly in more remote barrios and barangays. This view is based on the notion that herbal remedies are part of the Ilocano culture. Traditional healing practices survived the brutal repression that occurred over the course of time, the introduction of foreign medical systems and education during the advancement of technology, and the current difficulties that have been brought about by modernization and globalization. This fact cannot be denied. Traditional healing practices have been subjected to several challenges. These historical events have made it possible for different mixtures of local and foreign healing skills, superstitions, beliefs, and practices to continue existing in the present day. On the other hand, plants that are readily accessible to the general public are also used in order to bring beauty to the surroundings. In addition to its role as an ornament, it helps to make the house more environmentally friendly. These practices encourage an approach to health that is people-centered, cross-cultural, transdisciplinary, and critically reflective from an Ilocano viewpoint. This applies to both the structural and social models of health.

5.2 Symbolic significance or cultural knowledge on the sensitivity of Mimosa pudica in the life of the Ilocano

The makahiya plant is a fascinating plant species native to the Philippines. Due to its distinctive characteristics, it has earned a variety of aliases. Its scientific name is Mimosa pudica, but it is commonly referred to as the sensitive plant or the "touch me not" plant. The makahiya plant is a herbaceous perennial. It has compound leaves that adhere to one another and close in upon being stroked or agitated. After that, it takes a few minutes for the leaves to unfold.

The makahiya plant is comparable to other plant species. The plant's foliage is closed at night but emerges during the day. However, there are other stimuli that cause its leaves to close. It responds to contact, wind, and any vibration. Reduced turgor pressure is the cause of these reactions. When makahiya is stroked, its stems become stimulated and emit compounds that cause its leaves to close. According to alternative explanations, it is also a method for the plant to defend itself against hazardous insects.

From the Ilocano context, the makahiya have been known by a variety of names, including the lowly plant (which literally means "to die when touched") and the ant-plant. In the Philippines, it is often referred to as the makahiya, which literally translates to "a tendency to be shy.".

“dayta a bain-bain ket mangipakita ti maysa nga ugali dagiti nagkauna nga ilokano. Managbabain ken managrespeto, managdaydayaw ngem nu mapasakitam adda iduldulin na nga tangken ken kinatangsit. Ammo na iti kumayakay ti riribuk ngem ammo na met ti lumaban tapno salwadan na ti kinababa na”.

For the Ilocanos, it is believed that it not just uses as herbal medicine because of its chemical components but also a picture of a native Ilocana. Further, Ilocano community as described by an informant who long stayed in a foreign land boldly say that Ilocano people protect each other and live no room for individualism, and live collectively as one. Like the “bain-bain”, they stayed together and grouped together so that intruders cannot survive especially in the field where they thickly grow.

Another informant noted that
“bain-bain ket maysa a simbolo ti kinatao ni Ilocano, natangken, natibker ken naindur, ngem ti kaunggan na ket nalukneng ken napakumbaba, nadayaw ken nasingpet”. The Ilocano as she continues, “ni Ilocano, naayat, adda iti naidumduma a galad nga makapukaw rikna, ken makaguyugoy ti awisna”.

This context demonstrates that Ilocanos are raised to defend their territory. As evidenced by the makahiya's well-documented leaf-folding behavior, which is a defensive response to physical

stimuli, "clear habituation" is present. In addition, another source emphasizes that the "bain-bain" is an excellent representation of the fortitude, sensitivity, and sensibility of women. Despite their fragile appearance, mimosas are durable and resilient plants that can thrive in a variety of environments. In addition, they require very little maintenance and can withstand severe conditions, which are considered to be characteristics of a strong, independent woman.

"ti bain-bain ket kasla balasang a mailillili, mataripato a nasayaat ket agbalin a naindur, naridam iti aglawlaw na ken nabileg a mangsaranget ti kabil ni panawen ken tyempo".

The mimosa is a sensitive plant with leaves that coil up when stroked or when low temperatures are detected and thus represent sensitivity. However, it is also highly tolerant and can thrive in harsh environments. Therefore, it represents both tolerance and sensitivity. Some believe that seeing this tree will provide them with the fortitude and tolerance to manage any challenging situation they may encounter.

From the context of beauty, an informant says that

"ti bain-bain ket maysa a simbolo ti kinapintas, maysa a pagwadan a balasang, maysa a disenyo ti kinadiosa a mangitandudu ti kanga ni ilokana".

In a sense, the makahiya is a symbol of beauty because, due to its colorful and startling appearance, the mimosa plant is frequently used for ornamental purposes in gardens. Some believe that the attractiveness of a tree reflects a person's demeanor and the manner in which their gorgeous nature enriches the lives of those around them. In addition, the "bain-bain" resembles a basic Ilocano way of life. In some Ilocano barrios, the Mimosa pudica symbolizes expansion and the resolve to make certain life adjustments. It may also pertain to the expansion of various facets of one's existence, such as family, career, or special intentions.

More so, an informant is very blatant that

"ti bain-bain ken simbolo iti dangadang ti kinapada-pada".

In a sense, it symbolizes the equality of man and woman as everyone struggles for respect and acceptance. More often than not, it symbolizes women who are fighting for gender equality and women's rights.

6. Conclusions

Mimosa pudica is perceived by its patrons to be effective in alleviating health concerns and has significant meaning in the Ilocano way of life. The understanding of this plant (bain-bain) is based on prior experience, distrust of the current healthcare system, adherence to and belief in family tradition, and the desire to supplement extant Western medicine treatment. Further, it also highlights the cultural beliefs, knowledge, and practices since the very beginning of historical evolution. The Mimosa pudica is deeply rooted in the connection of humanity with the environment, the appreciation of creation, and the development of intelligence. Mimosa pudica also known as a touch-me-not, shame plant, or humble plant shows a significant symbol in the life of the Ilocano. Being an Ilocano, it shows the character of humility, respect, being down to earth, and being soft and kind-hearted.

This study was able to contribute to a broader understanding of the folk medicine culture in the Ilocano region through the collected data pertaining to the informants' personal experiences. Therefore, this study has paved the way for a better comprehension of these topics and contributed to a remedy for the dearth of literature depicting their culture.

This study helps health professionals in learning about Mimosa pudica and better comprehending patients who use it, thereby assisting them in providing holistic treatment. A physician's effort in guiding a patient's desire to combine folk medicine and Western medical practices can help bridge communication gaps by providing opportunities for open-minded health education, establishing trust, and improving doctor-patient relationships, ultimately resulting in improved treatment outcomes and patient experience.

Moreover, this also climaxes the connections of the plant to the culture and beliefs of the Ilocano. Undeniably, the plant shows the sweeping characters of the Ilocano culture, their way of life, and the meaning attached. The Ilocano people have a reputation for being thrifty and resilient in the face of adversity. Respect and modesty in commonplace interactions characterize the Ilocano personality; they focus on work and productivity. Similar to the characteristics of plants, Ilocano values include nurturing social harmony in order to promote tranquility. A strong sense of familial ties and duty is also a fundamental Ilocano value in relation to the Mimosa pudica flower.

Recommendations

Future studies may take into account and investigate further the use of Mimosa Pudica in health-related issues using the plant's roots. To assure the herb's safe use, Mimosa pudica is also exposed to toxicological tests, which future researchers may think about studying in the future. Taking mimosa extract orally results in virtually minimal side effects, including no mortality or weight change. Future researchers may look into a deeper analysis on its effect on mental process. Moreover, the extract also cannot affect the early pregnancy when it is given orally. However, when the extract was injected intraperitoneally, mortality and toxic symptoms such as the increase in serum enzyme levels and hindlimb paralysis were observed thus it is recommended to further study. Future researchers might do a more thorough investigation of its impact on thought processes. Furthermore, when taken orally, the extract cannot harm an early pregnancy. However, death and toxic symptoms such an increase in serum enzyme levels and hindlimb paralysis were seen when the extract was administered intraperitoneally, therefore more research is advised.

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