

Community agroecology. Facilitation of the cultivation of medicinal plants and family phytotherapy

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Abstract

Phytotherapy is among the main applications of traditional natural medicine. Various plants are grown in agroecological family and community gardens, whose use by the peoples for the treatment of symptoms and diseases is a common practice. Family and community self-management of medicinal plants, integrated into primary care services, contributes to sustainability in health management.

Key words: medicinal plants; community; agroecology

Introduction:

Natural and Traditional Medicine (NTM), more than a sum of therapeutic modalities not included within Conventional Medicine (CM), constitutes a body of knowledge that addresses the human being and the health-disease process in a holistic way (García 2013).

The origin of NTM is closely linked to that of humanity and the history of man in his fight for survival. It is considered the specialty that includes a set of therapeutic methods and techniques that consist of restoring balance in the individual and between him and the universe (Pulsan et al 2015).

80% of the population in developing countries benefit from NTM, due to cultural tradition or lack of options. In rich countries, many people turn to natural remedies because they consider that “natural” is synonymous with harmless (Torres and Castro 2014).

Among the main modalities of NTM used in Cuba are: acupuncture, phytotherapy, apitherapy, moxibustion, homeotherapy and ozone therapy. Some of the therapeutic uses of these modalities are: expectorants, antihypertensives, antifungals, anti-inflammatories, analgesics, immune stimulants, among others (Plain et al 2019).

The new ecological attitude leads to the appropriate use of natural resources and in response community projects are promoted in which medicinal plants play a primary role, because it is known that within the NTM they enjoy prestige in the population as therapeutic agents (Fuentes and Exposito 1995); as well as that, compared to conventional medicine, they prefer them, thus reflecting the influence of traditional knowledge; Therefore, they can

represent not only the solution to health problems, but also cultural and economic ones, in addition to providing enriching elements to work in the community (Acosta 2001).

From a broad perspective, agroecology is defined as the ecological management of natural resources through forms of collective social action. They present alternatives in the current crisis of modernity through proposals for participatory development (Sachs 1992) from the areas of production and alternative circulation of their products and aim to establish forms of production and consumption that contribute to facing the ecosocial crisis, and thereby restore the altered course of social and ecological coevolution (Norgaard 1994).

Agroecology has been the protagonist and integrator of other sciences during the process of decentralization and diversification of production and access to food in Cuba; At the same time, as the economic crisis worsened during and after the Covid-19 pandemic, its popularization has increased in human settlements, which have become communities with resilience capacities in food self-management, mainly by facilitating the participation and inclusion in the development of small-scale production systems (Vázquez 2023).

This article has the objective of recognizing that the emergence of community agroecology in Cuba, as a response to the economic crises that have occurred since the nineties, has also facilitated the increase in plants that families and communities traditionally use to make natural medicines.

Medicinal plants. Herbal medicine is the oldest form of healthcare known to mankind; throughout history, herbs have been used in all cultures of the world and there is extensive scientific documentation related to the use of plants to cure various diseases (Cruz et al 2017).

Phytotherapy is the branch of therapy, related to the application of medicinal plants, whole or their parts (stems, leaves, flowers, seeds, roots), dried or fresh, alone or associated, as well as their extracts and formulations, which other industrial active ingredients are not added for the prevention or treatment of health conditions (Álvarez et al 2017, Dueñas-Rodríguez et al 2023).

Medicinal plants throughout history have been used empirically for the relief and cure of symptoms and diseases. In the 19th and 20th centuries, prestigious scientists dedicated themselves to the study of various native and introduced medicinal plants; were a topic of interest for the Royal Academy of Medical, Physical and Natural Sciences of Havana (García et al 2010). Among these, the Cuban Juan Tomas Roig (1877-1971) was a prominent botanist who carried out the most extensive study of medicinal plants (Avello et al 2013).

Among the medicinal plants most used by the Cuban population are: Aloe vera, Cymbopogon citratus, Justicia pectoralis, Lippia alba, Ocimum basilicum, Ocimum tenuiflorum, Plantago lanceolata, Plantago major, Coleus amboinicus, Ruta graveolens, Pedilanthus tithymaloides, Senna alata, Anethum graveolens, Artemisia absinthium, Artemisia annua, Calendula officinalis, Capsicum annuum, Catharanthus roseus, Curcuma longa, Cajanus cajan, Xanthium strumarium, Foeniculum vulgare, Indigofera suffruticosa, Matricaria recutita, Melissa officinalis, Mentha piperita, Origanum majorana, Orthosiphon aristatus, Passiflora incarnata, Piper auritum, Salvia officinalis, Tajetes lucida (Acosta and Rodríguez 2006).

Various horticultural plants that are grown in agriculture, in addition to being used as a condiment, have great and varied medicinal uses, such as the following: Allium sativum, Allium cepa, Capsicum annuum; Petroselinum crispum, Ocimum sp., Coriandrum sativum, Eryngium foetidum Origanum majorana, Plectranthus amboinicus, Rosmarinus officinalis, Zingiber officinale (Acosta 2017).

Local studies show a high popular use, as found by Beyra et al (2004) in the province of Camagüey, where they identified 111 species belonging to 55 families of vascular plants, with most frequent use for respiratory conditions, followed by those referred to digestive disorders. and hepatobiliary, and those referring to dermatological uses; also followed in order of frequency are uses for kidney, infectious, cardiovascular, gynecological, parasitological, rheumatological, otalgic, ophthalmological conditions and conditions of the nervous system.

In Cuba there are 126 farms for the cultivation of medicinal plants, distributed throughout all the provinces, whose productions are used to obtain 30 natural products (Acosta and Tillan 2016); urban agriculture systems also carry out commercial production of medicinal plants, which contribute to the medicine industry and the community (Companiononi et al 2016).

In homegardens and other places around family homes in Cuba, it is common to find various medicinal plants planted in containers, flower beds or other systems. For example, in Marianao, Havana, 12 species of medicinal plants are common (Vázquez et al 2023) and Palmira, Cienfuegos, 25 species were identified (Terry et al. 2022).

Regarding mass production, within the framework of the agroecological production of medicinal plants, the protection of the environment and the demand for sustainable development, keeping in mind that these are crops in which, beyond increasing the yields of plant material it is about being able to synthesize their active ingredients to the greatest degree possible. Technologies have been established that, taking back popular knowledge and practices, keep these requirements in mind, which has made it possible to develop quality, healthy and well-nourished plants and increase yields. of the species (Acosta and Tillan 2016).

Community self-management of medicinal plants. The popularization and massification of agroecology in communities in Cuba constitutes evidence of Community Agroecology, as a popular attitude, based on peasant traditions, permaculture and urban agriculture, to integrate food self-management in the place where people live (Vázquez 2023), which also involves the cultivation and therapeutic use of medicinal plants.



Figure 1: View of different spaces where medicinal plants are integrated into family and community gardens.

Planting and technical attention to medicinal plants requires appropriate conditions (Acosta 2014). In the place where medicinal plants are grown, they should not be directly exposed to fumes or contact with toxic substances

and access by animals should be avoided. When grown in plots or fields, they should be associated or intercropped with other crops, to facilitate soil coverage, moisture retention and reduce the incidence of pests (Figure 2).

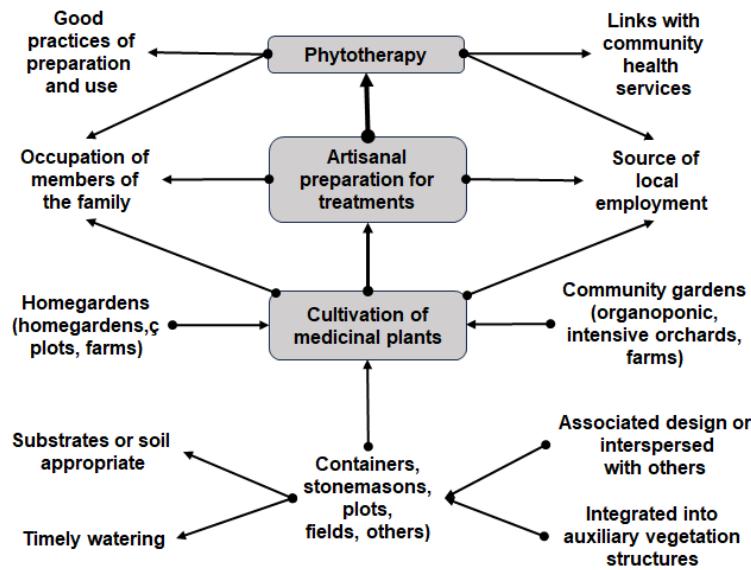


Figure 2: Family and community self-management of medicinal plants and phytotherapy.

These plants are very useful when integrated into the auxiliary vegetation structures of the garden, because they perform other functions: (a) their odors repel pest insects; (b) the flowers ornament gardens or other sites; (c) may be part of the perimeter fencing; (d) its flowers can serve as food for adults of beneficial insects (entomophagous).

The management of medicinal plants with repellent functions in the self-regulation of phytophagous insect populations has become widespread in urban agriculture, highlighting *Ocimum basilicum* (52.9% of organoponic gardens and 29.4% of intensive gardens) and *Origanum vulgare* (50.3% of organoponic and 34.4% of intensive orchards), among other species (Vázquez et al 2007).

The cultivation of medicinal plants and the artisanal production of biopreparations as medicines for family or community use constitutes an occupation for family members or a source of local employment respectively.

Families living in towns and cities care for and use medicinal plants guided mainly by mothers and grandmothers, who play a fundamental role in preserving family traditions. It also constitutes one of the main donations or solidarity exchanges that they manifest in the communities, due to the frequent flow of parts of medicinal plants in the face of an urgent need of any neighbor.

For family and community self-management of medicinal plants and phytotherapy, two requirements are important: (a) know the species (identify it correctly), how it is prepared, for what purpose and how it is used; (b) establish links with community health services (technical advice, medical consultation).

Importance of integration from the community health system. Since the approval of NTM as a medical specialty within the Ministry of Public Health of Cuba in 1995, the integration of conventional and non-conventional practices for the benefit of Medicine was established as a principle, explicitly rejecting the terms of complementary and alternative because NTM does not constitute an option in addition to or instead of CM, but rather integrated with (WHO 2002, García 2013). This principle contributes to sustainability

in local health management, mainly in rural and peri-urban communities, where the limitations of access to medicines and the possibilities of growing medicinal plants in family gardens combine.

Since the economic crisis unleashed in the 90s, the importance of communities as a setting has been resized, as a result of the limitations of central resources to solve their problems and the increase in population and activities that take place in that scope (Zabala et al 2020).

Through social practice, societies have developed experiences and systematized special ways of "knowing and knowing" about health and illness, which have been configuring a set of notions and knowledge formed in the daily and spontaneous practice of people. common, until reaching the empirical practice that concentrates and systematizes the experience of the community over a long time. This informal knowledge, of undoubted cultural value, is considered by some health experts as something that needs to be preserved or recovered due to its secular value (Silva 1997).

Particularly, the traditional use of medicinal plants was never abandoned in Cuba, since the peasants, and also their descendants, although they did not continue living in the countryside, maintained confidence in their healing power, so that the rise of industrial medicine and the massification of the health system that occurred in recent years did not prevent popular culture from following this practice (García 2001).

In Cuba, the uses of plants for food and medicinal purposes represent the historical result of the interaction between ethnic groups within Cuban culture, and between them and the island environment (Nuñez and González 1999).

Community integration in health management currently acquires great importance, because CM faces other problems generated by modernity: drug resistance, drug residues in the environment and dysbiosis in the abdominal ecosystem of patients.

Due to drug resistance, public health faces a global crisis, marked by the need to develop new drugs and find therapeutic alternatives. Particularly for the treatment of infectious diseases, for thousands of years, natural and

traditional medicine has provided natural advantages in their treatment (Dubichel et al 2024).

Antimicrobial properties (antibacterial, antifungal, anthelmintic, antiparasitic, antiviral, antiseptic) are attributed to countless plants, much of which is due to popular beliefs that have been transmitted from generation to generation since ancient times. However, it is advisable to use for therapeutic purposes only those that have been studied through the scientific method and have proven effectiveness. In this regard, various biopreparations can be found in the network of pharmacies in Cuba, in master formulations, with different presentations such as: fluid extracts, aqueous extracts, tinctures, melito, syrups, tablets, capsules, etc. They can also be used naturally, in decoction, infusions, poultices, among others (Dueñas-Rodríguez et al 2023, Ruiz and Mejía 2020, Plaín et al 2019).

On the other hand, the wide range of medicines used to prevent and treat diseases increases every year. A report states that, in the European Union, where around 3,000 active ingredients are authorized, between 50 and 150 grams are consumed per person per year. These data reveal two major concerns: the first is the fact that there are more medications than necessary in homes, either due to the accumulation of leftovers from a treatment (expired or not) or due to self-medication; and the second is associated with the elimination of these products through household sewage (Osakidetza 2016).

In this regard, local and international research confirms that the uncontrolled elimination of medications causes pharmaco-contamination of the environment (water, air, soil), which is evidenced through the growing increase in emerging contaminants found in water, in sediments, of rivers and streams, in aquatic species and even in the fauna that drinks or consumes these organisms (Vicentin et al 2021).

The possible impact on human health due to drug residues present in the environment is little studied. Exposure can occur, mainly by consuming drinking water, vegetables and tubers, meats, fish and dairy products (Burns et al 2017). Due to the low concentrations that contaminants usually find, it may seem like a negligible risk when analyzed product by product (Huang et al 2010).

Due to the widespread consumption of pharmaceutical products in modern society, we can find them in the wastewater of industries, hospitals and sewage effluents. Not all pharmaceutical products are removed sufficiently with current treatment systems, so they can be present in the effluents of treatment plants, in different bodies of water and even in drinking water at very low concentrations (Quesada et al 2009).

On the other hand, several cohort studies have reported potential associations between use of specific drugs and dysbiosis that lead to alterations in functional profiles of the intestinal microbiota. One of the first studies reported quantitative and qualitative changes in intestinal microorganisms secondary to the consumption of commonly used medications (García-Mazcorro et al 2018).

Commonly used medications (such as antibiotics, proton pump inhibitors, non-steroidal anti-inflammatory analgesics, among others) play a particularly important role in the intestinal ecosystem, which can lead to the development of diseases or complications of pre-existing diseases (Weersma et al 2020).

However, associations between medications and microorganisms have initially been evaluated for individual medication consumption; However, it is known that patients often have indications for the use of several drugs and this co-medication can be a source of confusion when evaluating adverse effects (Falony et al 2016).

Furthermore, the wide availability of several of these drugs, some over the counter, can become a serious problem for the health of the population, since chronic use, abuse and uncontrolled combination can lead to severe long-term problems. A greater number of clinical trials are necessary to evaluate the side effects of both antibiotics and other drugs on the intestinal microbiota, since alterations in their quantity and composition can lead to health problems that to date are little known (Mejía-Montilla et al 2021).

The integration between food and health is increasingly valued. The intestinal ecosystem is a complex environment in which dynamic and reciprocal interactions occur between the epithelium, the immune system and the local microbiota (Almada et al 2015). Likewise, the concept of a nutrient as any assimilable substance contained in food, which allows the body to obtain energy, build and repair tissues and regulate metabolic processes, has passed to that of an immunonutrient, which is a substance that, unlike a nutrient conventional, is capable of enhancing the immune system (Chandra 1991).

In the search for a healthy diet, the redesign of food production systems under the principles of Agroecology, facilitates the functional interactions of biodiversity that contribute to its capacity for ecological self-regulation and that of the intestinal ecosystem of the people who consume said foods (Vázquez 2022a)

The original human populations lived in communities, where they coexisted in a feeding system integrated into the natural habitat. With social development, they were regrouped into urban (towns and cities), peri-urban and rural socio-ecosystems. These characteristics have contributed to the current society being composed of population conglomerates in anthropized habitats, where the quality of food and the state of health, which are still valued separately, have become important social problems, even in rural areas, where the influences of modernity have eroded traditional food culture and medication (Vázquez 2022b).

The local coordination of actors to co-manage Popular Education on sustainable food and health from the communities, under the principles of Agroecology and the One Health approach, constitutes a strategy that energizes the transition towards sustainable local food systems.

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