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Utilization of Genomic Resources for Medical Plant Breeding

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Description

In the biological sciences, it is common to believe that indigenous cultures' use of medicinal plants is rooted in a long tradition known as "traditional medicine." However, because oral traditions have a limited historical depth and archaeological evidence does not provide evidence for the specific medicinal use of a plant, ethnobotanical studies cannot typically provide evidence on the antiquity of specific uses for medicinal plants.

Medicinal Plant Resources

It is generally accepted that indigenous cultures have utilized medicinal plants for centuries (referred to as "traditional medicine"). However, there is virtually no evidence to establish the historical breadth of traditional medicinal plant use in cultures without written records. The question of the historical depths of medicinal plant use cannot be answered by archaeobotanical research because archaeobotany does not provide evidence for a species' medicinal use and it is actually difficult to establish the exact use context of such findings. However, archaeobotanical research may provide evidence for the use of food plants that were widely used in a society and stored so that remains can be detected. The use of plants in magico-religious ceremonies can be clearly deduced from archaeological relics, which include human art in the form of paintings, rock carvings, amulets, ceramic artifacts, stone figurines, and monuments, as well as dried plant material. Overall, there is no evidence for medicinal plants in their more general sense, only for a few isolated and significant species that are used as stimulants and hallucinogens.

From a variety of perspectives, establishing the historical depth of medicinal plant use is pertinent. Not only would this research demonstrate the historical development of an intricate relationship between a culture and its environment, but it would also demonstrate unambiguously that indigenous cultures have an in-depth knowledge of certain botanical taxa that has been transmitted over centuries prior to its becoming important in the context of developing novel pharmaceuticals or nutraceuticals. The indigenous people's local knowledge includes information about the ecosystem as a whole as well as specific plants used for food, medicine, construction, and other purposes. The documentation of this knowledge as well as a deeper comprehension of its botanico-historical roots has emerged as an essential component of ethnobiology in light of the rapid loss of such knowledge.

Ethiopian traditional medicine relies heavily on medicinal plants. The community of rural Ethiopians was surveyed using a questionnaire to find out how many and what kinds of medicinal plants they used for self-care. Using a semi-structured questionnaire, 700 mothers were questioned. It was discovered that herbal medicines were used in self-care 12.5 percent of the time. Twenty-five plant species from 21 families were reported, each with its own local name, preparation methods, and components. Nearly every culture has a body of knowledge devoted to the therapeutic properties of the local flora, and the use of plants as medicines predates written human history.

Self-care with plants is common in Ethiopia, despite the fact that most practices and treatments in herbal medicine

require specialists or professionals known as herbalists. Although there have been few studies on Ethiopia's medicinal plant resources, it is unknown how many and what kinds of herbs the majority of people, especially in rural areas, use for self-care. Incorporating herbal medicine into a nation's health care delivery system and knowing the factors that influence the selection of various treatment options at the household level are also important. In the majority of rural communities in developing nations, including Ethiopia, mothers are the family's de facto healers, using medicinal plants to treat injuries and illnesses.

The study of how people and plants interact in their local environment is what is known as ethnobotany. This research has two distinct objectives or approaches: The contribution to our understanding of a portion of human cultural heritage and the pursuit of novel pharmaceuticals or useful products derived from plants. Ethnopharmacology is typically associated with this second objective, but it also addresses the first. Because it is a multidisciplinary field, it must take into account the perspective of finding products that can improve human health as well as the social structure, wealth, and issues of the communities from which the information is derived.

Pharmacological Aspects

Traditional medicine is still used to treat malaria in developing countries, where the disease is rampant. However, there are insufficient scientific data to evaluate these herbal remedies' efficacy. Therefore, it is essential to investigate medicinal plants with a folkloric reputation for their antimalarial properties in order to determine their efficacy and their potential as potential sources of new antimalarial medications. Based on these findings, it appears that the Korean medicinal plants and the polyphenols that were isolated from them and had effective radical-scavenging activity may be promising agents for scavenging free radicals and treating conditions caused by an excess of free radicals. The preservation and promotion of this cultural heritage, also known as alternative medicine, which serves as the sole therapeutic option for the underprivileged population, is crucial. In this area, research should be done on phytochemical, pharmacological, and toxicological aspects.

The recognition of medicinal plants' value as potential sources of new compounds with therapeutic value and as sources of lead compounds in drug development has led to extensive pharmacological research on medicinal plants, the foundation of traditional medicine, over the past few decades. At concentrations that can activate oxidative enzymes like phospholipase and xanthine oxidase, calcium can enter cells' cytoplasm, deplete cells of cysteine and glutathione, release free radicals from mitochondria, and cause cell death. At the point where neurons and glia meet, crucial molecular components include glutamate and its receptors. As a function of health, dietary factors can alter physiological functions, such as brain function, thereby increasing a population's economic productivity. The prophylactic potentials of diet, nutritional/food supplements, medicinal plants, and herbal extracts will be easier to define if we have a better understanding of the molecular mechanisms of neuroprotection, oxidative stress, and immune function.