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The Ancient Prescription: Traditional Healing Knowledge, Plant-Based Food Systems, and Planetary Health

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Abstract

Archaeology can inform sustainable futures by recovering how earlier societies organized food production, medicinal plant use, water, soil, and collective life. This narrative review develops the Ancient Prescription framework through published research from the Maya Mountains of southern Belize, connecting terrace archaeology and paleoethnobotany with living Maya healing traditions, medicinal-plant conservation, and food-first care. The Sahonak Tasar terraces suggest an integrated cultivation strategy involving soil retention, burning, and managed flooding, while botanical remains reveal resources extending beyond maize. The Quebrada de Oro stela adds political and settlement context. Lemongrass illustrates both the value and limits of ethnographic analogy: modern cultivation is documented, whereas archaeological identification remains provisional but likely. The proposed association of *Tynanthus guatemalensis* with the k'an glyph provides a further bridge among material culture, botanical knowledge, and laboratory investigation. The HerbalGram, Sustainability, and Human Ecology accounts of the Itzamma garden project connect these questions to modern-day community-led practice solidifying a 1300 year continuity. Archaeology contributes a long-term perspective and testable hypotheses; contemporary communities, agronomic studies, and clinical evaluation determine how historical insights can be responsibly adapted. The review retains food-first care, knowledge stewardship, and community-defined outcomes as practical priorities.

Keywords: Archaeology; Paleoethnobotany; Ethnobotany; Maya; Traditional Healing Knowledge; Sustainable Cultivation; Medicinal Plants; Planetary Health; Sustainability; Longevity; Integrative Medicine

Introduction

Climate change is an ecological and public health emergency. Its consequences include threats to the plants, places, and relationships on which traditional healing depends. The Healing Across Cultures (HAC) research program described health as embedded in the relationship between people and their environment [1]. The two decades of transdisciplinary field research and clinical work that followed inform this review: traditional healing knowledge should help shape how planetary health is practiced, rather than serve only as background for environmental or biomedical research. The central question is how to carry that knowledge into conservation, professional education, and food-first care while preserving the authority of the communities who sustain it.

The case for urgency begins with the relationship between habitat and access to care. Where healing traditions depend on locally gathered plants, forest loss threatens a source of medicine as well as the setting in which identification, preparation, and use are learned. Conservation therefore has a public health dimension that is not captured by carbon accounting alone [2,3].

The Maya case is instructive on multiple levels. Drought interacted with political and economic pressures during the uneven decline of Classic Maya centers [4]. The persistence of Maya food traditions depended on adaptation and diverse cultivated resources. Archaeological phytolith and pollen analyses in the Maya Mountains of Belize provide evidence for complex plant use and a proposed combination of burning, flooding, and slope-

catchment terracing [5,6]. These findings warrant investigation as potential sources of sustainable practice, rather than unqualified replication. The practical question is what can be learned from their design, environmental setting, and social context.

Archaeology and sustainable ways forward

Archaeology makes the relationship between health and environment visible over timescales that a contemporary intervention cannot encompass. A terrace wall, a household midden, and a monument preserve different aspects of how people inhabited a landscape. Read together, these records help reconstruct the material and social conditions supporting food and healing. The contribution to sustainability is practical: archaeology can identify alternatives to present assumptions, reveal the investments required to maintain them, and generate hypotheses that can be tested with communities today [5,6,7].

Recent syntheses of Maya lowland agriculture challenge a uniform picture dominated by maize and shifting cultivation. They emphasize diverse crops, homegardens, agroforestry, and management of wild resources, alongside lasting investments in soils, terraces, water systems, and perennial plants [8,9]. The Maya Mountains research belongs within this wider reassessment. Its particular value is the opportunity to connect archaeological cultivation evidence with collaborative ethnobotanical research in the same region. This connection broadens the Ancient Prescription from individual remedies to the landscapes and practices that sustain access to food and medicine.

Terraces as productive infrastructure

The Sahonak Tasar terraces near Muklebal Tzul provide a concrete example. Stone retaining walls supported earthen shelves on a hillside beside a stream. The 2009 Antiquity report and the fuller 2011 paleoethnobotanical study interpreted the terrace sequence as more than passive erosion control. Nine strata were recognized; detailed preliminary analyses included two adjacent terrace layers. Charcoal and vitrified plant tissue supported burning, while diatoms and freshwater sponge spicules supported episodes of inundation. An inflow canal reinforced the interpretation that water and sediment could be directed into the terrace system [5,6].

Taken together, these observations suggest a cultivation strategy combining slope catchment with burning and flood-borne soil deposition. The proposed achievement was the maintenance or renewal of productive soils within a restricted area of arable land. The sequence and timing of these activities, however, were not fully reconstructed. The evidence supports investigation of deliberate soil building; it does not establish measured crop yields, nutrient budgets, or continuous sustainability throughout the occupation [5,6].

For contemporary application, the transferable question is how cultivation can retain and renew the resources on which it depends. Archaeological reconstruction could guide small, community-designed trials comparing sediment capture, soil organic matter, water use, nutrient retention, crop diversity, and labor requirements. The historical presence of burning would not by itself justify its reintroduction: smoke exposure, nutrient losses, fire risk, and local ecological conditions would require assessment. Archaeology supplies a candidate system and its context; agronomic evaluation determines which components remain useful.

Plant diversity and the interpretation of healing

The botanical record expands the range of resources considered. The terrace assemblages contained abundant phytoliths assigned to Zingiberales and bamboo-related morphotypes, while the 2011 study identified a phytolith diagnostic of arrowroot, *Maranta arundinacea*, in terrace sample TL-6. Other assignments remained at broader taxonomic levels or required additional comparative material. The resulting picture is one of diverse plant use rather than a single crop standing for the whole food system [5,6].

Food and medicinal functions must nevertheless be distinguished from plant identification. Arrowroot provides a strong example of a food resource whose wider ethnobotanical uses invite questions about healing. Its presence in a terrace does not establish why it was grown or how it was administered. Similarly, phytoliths associated with families containing medicinal species make those species relevant candidates for study; family membership alone cannot demonstrate an ancient therapeutic practice [6]. These distinctions strengthen the review's central proposition by keeping its historical foundation open to verification.

Lemongrass and living Maya practice

Lemongrass offers an instructive connection to present practice, with an important contextual qualification. In the 2011 study, the phytoliths resembling *Cymbopogon* were reported from the residential midden at Quebrada de Oro, rather than as a confirmed lemongrass identification from the terraces. The authors described the resemblance as non-diagnostic and conditional on further research [6]. The HerbalGram account connects the discussion to a documented living practice: fevergrass, *Cymbopogon citratus*, was cultivated at the Itzamma garden and described as traditionally used for fevers, colds, and influenza [10]. That report documents use, not clinical efficacy.

Present use cannot resolve archaeological identity or chronology. Kew lists *C. citratus* as native to southern India and Sri Lanka and introduced in Belize [11]. A claim of this species in a Classic Maya context would therefore require particularly strong taxonomic and chronological evidence. Comparative phytolith collections, assessment of later disturbance, and secure dating are needed before claiming pre-Columbian lemongrass use. The

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example remains valuable because it shows how living knowledge generates archaeological questions while archaeology tests, rather than merely repeats, an assumption of continuity.

The stela and the social organization of landscapes

The Quebrada de Oro stela contributes a different scale of evidence. Abramiuk, Wanyerka, and Pesek reported its discovery near large house-mounds outside the site core during the 2007 field expedition. Its location challenged an earlier assessment that the center lacked stelae. The report considered several possible political explanations, without resolving who commissioned the monument or its precise function [7]. It does not directly identify an agricultural or healing institution. Its relevance here is that productive landscapes were also inhabited political landscapes: interpreting cultivation requires questions about settlement, authority, access, and resource exploitation and exchange. Sustainable applications should likewise ask who controls land, water, and the benefits of improvement.

Plant-Based Food Systems as Planetary Medicine

Food is a practical point of contact between traditional healing and contemporary public health. A food-first approach can connect dietary counseling with the protection of the landscapes that sustain local food and medicinal resources. The environmental effects of food production vary markedly across products and production systems [12]. That variation should inform practice without reducing the value of a traditional food system to a single footprint estimate. For clinicians and educators, the task is to translate environmental evidence into advice that is affordable, nutritionally optimal or at least adequate, and meaningful within the community receiving it.

Implementation should also distinguish a traditional practice, a plausible biological mechanism, and a demonstrated clinical effect. Each can inform a research question, but none automatically establishes the others. The authority of traditional knowledge does not depend solely on identifying a compound that resembles a pharmaceutical intervention. Its relevance also lies in how people organize food, healing, habitat, and mutual responsibility [1]. This wider contribution should remain visible when traditional practices enter professional education or public health programs.

Traditional Knowledge as Evidence

The argument is grounded in collaborative field research with Q'eqchi' Maya healers and the Belize Indigenous Training Institute (BITI) in the Maya Mountains of Belize. The published surveys describe more than 160 medicinal species and examine their distribution using environmental categories recognized by healers [2,3]. In the reported analyses, medicinal plant diversity varied significantly across Maya zones, while the scientific ecosystem classification did not reach statistical significance [3]. These tests do not directly compare predictive accuracy. Their practical importance is that a conservation plan can miss culturally relevant distinctions if it begins and ends with externally defined categories. The healers' classifications deserve a substantive place in deciding what to protect and how protection is organized.

Pharmacological studies provide another kind of evidence. In a human monocyte cell line, *Neurolaena lobata* extract reduced stimulated TNF-α production; several isolated lactones showed activity greater than the positive control compound parthenolide (the principle active compound in commercial feverfew) [13]. Work on antidiabetic plants, including *Tynanthus guatemalensis,* found antiglycation activity comparable to positive control quercetin in laboratory assays [14]. An investigation of the k'an glyph proposed a connection between this vine and Classic Maya cacao vessels [15]. These examples illustrate productive questions arising from traditional expertise.

The k'an glyph and botanical interpretation

The k'an glyph provides a complementary bridge between material culture and living plant knowledge. We proposed *Tynanthus guatemalensis* as a candidate for a botanical association of the glyph on Late Classic cacao vessels. Our argument brought together the vine's cross-shaped xylem, yellow coloration, aromatic properties, and contemporary healer knowledge; allspice had been an earlier candidate [15]. This remains a botanical and iconographic interpretation, rather than confirmation of a vessel's contents. Targeted residue analysis and comparison of securely contextualized objects could test the proposal. Its methodological value is the dialogue among archaeology, botany, language, and contemporary expertise, with laboratory antiglycation findings providing a separate line of investigation [14,15].

Living conservation and the Itzamma garden

The HerbalGram account describes Itzamma as a healer-led initiative joining a healing center, plant cultivation, conservation, and education. Plant collections and propagation, cultural activities, and opportunities to teach younger generations made the garden a place where knowledge could continue to be practiced [10]. This is a useful contemporary counterpart to the archaeological questions: access to plants depends on maintaining both suitable growing conditions and people able to identify, prepare, and steward them.

The Sustainability study documented 102 medicinal species at the garden, including 62 not recorded in the prior consensus-study comparison. It positioned community health, in situ and ex situ conservation, and intergenerational knowledge transmission within a shared program [16]. These are documented features and proposed benefits of a community-based model.

The Human Ecology agro-ecological survey further examined approximately 130 cultivated plant resources, documenting approximately 40 additional medicinal species beyond the 102 recorded by Otarola Rojas et al., and emphasized ecological

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conditions, cultivation challenges, and practical site improvements [17]. Its contribution is to make implementation visible. A medicinal garden must support the environmental requirements of its plants as well as the social purposes of its practitioners. In this review's interpretation, pairing that work with terrace archaeology suggests a productive research agenda: investigate how knowledge of microenvironments, soil, and water supports diversified cultivation in each setting, without assuming that the modern garden reproduces the ancient system.

Healing Across Cultures and the Fx→Nx→Rx Framework

The HAC work and the Secrets of Long Life (SLL) exploration offer a basis for discussing food, place, community, and wellbeing together [1,18]. In *Eat Yourself Super*, these concerns are brought into a food-first approach to health [19]. The Fx → Nx → Rx framework expresses the proposed clinical sequence as food, appropriate nutraceutical support, and pharmaceutical treatment when indicated and necessary. The sequence should guide a conversation about care rather than imply that every traditional practice is effective or that necessary medication can be withheld. A grocery-based program could make the food component accessible where purchasing decisions occur; the public health value of that approach remains to be evaluated.

The SLL study documented 37 elders — including 14 verified centenarians — across four populations on three continents: the Maya Mountains of Belize, the Appalachian Mountains of the eastern United States, the Western Ghats of India, and the East African highlands. Consistent patterns across all four populations included reliance on traditional plant-based diets, preference for traditional medicine as first-line primary care, and extensive time in natural settings. None relied on modern pharmaceutical medicine as frontline intervention. These cross-cultural convergences provide empirical grounding for the Fx→Nx→Rx sequence: the populations living longest were, without exception, living the framework [18].

A useful evaluation would measure more than dietary change. Proposed outcomes include access to culturally appropriate foods, participation of knowledge holders in program decisions, continuity of plant knowledge across generations, and the availability of locally important medicinal species. Clinical outcomes and medication use should be assessed separately from environmental estimates. These are proposed criteria for future work, not results reported in this review. They would help determine whether a program benefits the people whose traditions inform it.

Discussion

Archaeology's strength in this synthesis lies in its independent evidence of past choices. Ethnography helps formulate interpretations; stratigraphy, botanical remains, and artifact context can support or challenge them. Contemporary Maya communities should not be treated as unchanged representations of Classic populations. The 2011 study itself recognized historical movement and the limits of ethnographic analogy [6]. Continuity, exchange, adaptation, and later introductions are all possibilities to investigate. Sustainability should therefore be evaluated through specific practices and outcomes, rather than inferred from antiquity alone.

Three connected applications follow. Archaeological work can refine the identification, dating, and function of plant remains and cultivation features. Community-led conservation can sustain plant resources and knowledge while defining which information may be shared. Food-first health initiatives can test whether culturally grounded access to diverse foods improves wellbeing. These activities should remain linked through shared questions and governance, while their archaeological, ecological, and clinical outcomes are measured separately.

Traditional healing contributes to planetary health through relationships as well as remedies. The practical challenge is to make room for those relationships within conservation planning, clinical education, healthcare provision and food-based health initiatives. Partnership should include agreement on how knowledge is documented, who may access it, and how participating communities share in the benefits. Building on the published Maya research, this review proposes that knowledge stewardship and community-defined measures of benefit become part of implementation itself. The aim is to sustain the people, practices, and living resources together.

Conclusion

Archaeology can contribute directly to sustainable ways forward by recovering the relationships among cultivation, healing, landscape management, and social organization. In the Maya Mountains, terraces, plant remains, and a stela provide complementary evidence of how people made a constrained landscape habitable and productive. Living Maya expertise and the Itzamma conservation work bring contemporary priorities into that inquiry. The Ancient Prescription retains its practical sequence of food-first care, appropriate supplementation, and necessary medication, while locating health within the ecological and cultural conditions that sustain it. The next step is collaborative testing of specific practices, with benefits defined by the communities involved.

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