

The Ethnobotany of Noni (*Morinda citrifolia* L., Rubiaceae): Dwelling in the Land between Lā'au Lapa'au and TestiNONIals

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Other speakers at this conference advance our knowledge of the pharmacology, botany, and commercial production of noni. We offer a complementary perspective that contextualizes this plant in its contemporary cultural, epidemiologic, and economic landscape. Specifically, we position noni as part of the trend toward self-medication and the use of complementary and alternative medicines – CAM. On the one hand, the popularity of noni is representative of the rapidly expanding use of CAM in Hawai'i, the USA, and worldwide. On the other hand, the extreme celebrity of noni distinguishes it from almost all other CAM products. We explore a complex of factors that have shaped the transformation of this traditional Polynesian medicine into an item of contemporary popular medical culture that has myriad uses and considerable commercial success.

What are CAM?

Complementary and alternative medicine is a broadly inclusive category of products and endeavors that are united only in their juxtaposition to conventional allopathic medicine (e.g., Fontanarosa 2000; Jonas and Levin 1999; Micozzi 1999). CAM range among such diverse modalities as plant and animal products, healing touch, megavitamin therapy, prayer, and many more. Like noni, many CAM are botanicals that are linked in some way to indigenous pharmacopoeias.

The attention of clinical medicine was first drawn to the alternative nature of CAM. Health care providers expressed concern that these products lacked the formal sanction of the Food and Drug Administration (FDA), and that their use posed a health risk because patients did not, or delayed, seek(ing) biomedical care. But studies rapidly showed that CAM are most often utilized in tandem or in sequence with biomedicine, not as alternatives (e.g., Fautrel et al. 2002; Fink 2002). In fact many people who use CAM seek these products following a physician's diagnosis of some condition or illness. Thus, the term complementary was added to the mix. By now,

health care providers can no longer ignore that patients use products in addition to those prescribed by physicians. This is the actuality of contemporary health care in the West: a mix of biomedical and informal/self-diagnosis, pharmaceutical management, and home care. Increasingly, health care providers try to understand the meaning and content of CAM in order to judge how the combination of formal and self-care will affect their patients' well-being. In the latest iteration, the term *integrative medicine* more accurately represents the direction in which health care is moving (e.g., Lewis 2002).

In the US informal regimens such as lifestyle and diet modifications were popular decades ago. In the last 10-15 years self-care has evolved into the use of increasingly formalized commercial products and programs. Because CAM are not under the direct authority of the FDA, there is no requirement to standardize or otherwise regulate these products. CAM are readily available in an enormous number of product types that range among single-ingredient tablets, elixirs, salves, and beverages to integrated diet, supplement, and exercise regimens. Noni approximates this range – hundreds of products represent raw fruit fermentations, tablets, and complex regimens that include topical and internal applications in the context of lifestyle and diet modification.

Rationale for and growing popularity of CAM

All CAM, and especially botanicals, have been gaining rapidly in popularity: the US botanical (“herbal”) medicine industry estimates sales at \$6-8 billion, and botanical dietary supplements at \$4 billion (Herb Research Foundation 1999). Just a few years ago global nutraceutical sales totaled \$86 billion (Smith 2002). One projected potential for botanical medicines and supplements is as high as \$250 billion, which is as much as half the food market and 2.5 times that of pharmaceutical and over-the-counter markets combined (Smith 2002), although this figure may represent vested interests. (Stephen DeFelice, who coined the term

nutraceutical, is Chair of The Foundation for Innovation in Medicine, which encourages a research-driven, rather than market-driven, nutraceutical industry). It is suggested that at least through the year 2006, the fastest growth opportunities will be in Asia, the Pacific, Africa, the mid-East, and South America (Freedonia Group 2002). Other market watchers note declining sales of botanical dietary supplements during the last three years, and attribute this to negative media coverage (Blumenthal 2002). Whatever the real figures, CAM are indisputably a market success.

Dissatisfaction with biomedicine

One reason for this growing popularity is dissatisfaction with biomedicine. Long ago the *kahuna lā'au lapa'au* expanded their botanical pharmacopoeia to cope with the (primarily infectious) diseases that were introduced to the Islands on European contact. In something of an analogue, biomedicine today struggles to respond as the epidemiological terrain shifts to chronic disorders and diseases of surfeit. These include diabetes, cardiovascular disease, and cancers for which biomedicine has developed no cure, and cannot manage effectively. This bears on the complex nature of these illnesses, which have no discrete, identifiable cause and affect multiple organ systems. "Many of the disorders for which noni is used are chronic conditions from which patients do not fully 'recover' or [even] experience clear landmarks of improvement" (Dixon et al 1999:59). Further, treatment for these chronic disorders cannot be generalized over a patient population. The management of chronic disease requires adjustment for individual metabolism, medical history, and lifestyle – i.e., does not lend itself to one-size-fits-all biomedical therapeutics.

Agency, authority, self-care

Another influence on the increasing popularity of CAM is the pragmatic and experimental nature of people's health-seeking behavior. Contemporary US society promotes proactive health care, as reflected in a reconfigured clinic culture in which patients invest less authority in health care providers – i.e., they command more agency in their own care. These figures are instructive: a national survey conducted by the Consumer Healthcare Products Association found that 73% of Americans prefer to treat themselves at home; 57% of Americans reported either using or researching nutritional supplements (West 2001). Other studies, using various methodologies, report CAM use prevalence ranging from 10% to 93% (e.g., Adams et al. 2002; Ernst 2000). Biomedical professionals in the US have only recently be-

gun to identify themselves as "cohabitant[s] in a postmodern medical network in which consumer preferences dictate the service profile" (Kaptchuk and Eisenberg 2001:189).

Commodification of health

Related to issues of proactive health care is an explosion of information provided by the media and by health authorities on topics ranging among nutrition, exercise, cancer screening, and so on. As patients command a more prominent role in their own health care, clinical encounters increasingly incorporate patient education through better explanation of diagnosis, prognosis, and course of treatment. Capitalizing on that curiosity, the CAM industry also offers the consumer an enormous amount of "information" – of highly variable quality – through the internet, popular press, television, and other media. For some consumers this creates a false sense of comprehension: many do not know how to critically evaluate information and to a large extent "regard what are substantively and conceptually highly asymmetrical alternatives to be collaterals... one as likely as another to be potent, disease-specific, and effective (Dixon et al. 1999:51).

In a parallel trend, perhaps as a case of the tail wagging the dog, the advertisement of pharmaceuticals has become more commonplace. Pharmaceutical ads not only are more prominent in professional journals, but increasingly they also appear in popular media (e.g., newspapers, radio and TV, and magazines directed to particular demographics such as women and sports enthusiasts) (Anonymous 2000; Neumann et al. 2002). Thus the influence of the CAM industry on consumers, health providers, and the meaning and substance of clinical encounters is even more far-reaching.

"Natural/organic/holistic"

CAM products also are attractive because, compared to biomedicines, they are perceived by consumers to have fewer or no side effects because they are, or are at least derived from, "natural" products. Once located among more affluent and more educated demographics, the trend toward natural/organic lifestyle is moving deeper into the socioeconomic scale, as more middle-class and lower-class consumers are drawn to these products (Spencer 2002).

Many CAM are promoted as food supplements and "herbs." Commonly these products are further specified as nutraceuticals, phytochemicals, and cosmeceuticals. The prefixes "nutra-" and "phyto-" register these products as nutrients and plants. Similarly, the affix "cosme-"

draws attention to other-than-drug qualities. At the same time, all three terms include the word element “-ceutical.” This draws attention back to drugs, but now to the positive attributes of pharmaceuticals – namely, their demonstrated efficacy in preventing and treating disease. In this way, the language of CAM promotion both digresses from the substance and style of biomedicine and maintains a link to the technology in which consumers have become confident (Etkin and Ross in press). Highlighting the benefits of natural and synthetic medicines, “the best of both” is indeed persuasive.

Cost

Growing health care costs and government reductions in health care expenditures also may contribute to the growing popularity of CAM. CAM products are generally perceived to be less expensive than pharmaceuticals, even though some CAM are costly indeed (Bodeker and Kronenberg 2002; Egan 2002; MacLennan et al. 2002). In fact, one could argue that because pharmaceuticals and other biomedical technology tends to be covered by third party insurance, it is actually less costly to (insured) consumers. These circumstances are changing, albeit slowly. In an effort to cut their own costs, conventional insurers have begun to reimburse for a limited number of CAM modalities: acupuncture, massage, and chiropractic are the most evident, and perhaps predictable, examples (Carlson 2002; Cleary-Guida et al. 2001). Further, a growing number of HMOs, MCOs, private physicians, and other health care providers capitalize on the popularity of CAM by selling these in their own facilities (Fontanarosa 2000; Schneider 2002).

Still, even consumers who know that CAM are more expensive are willing to pay high prices. A US nationwide survey of health attitudes and reported that 36% of “Boomers” (the demographic who will reach age 65 in the next 10-20 years) and retirees are willing to pay more for the services of a CAM (chiropractic) practitioner than an MD. And the number of consultations with CAM practitioners over a given period of time exceeded the number with MDs (Triad Healthcare 2002).

Noni as CAM

In some ways noni is the quintessential CAM. It evokes the exotic, the connection with place and tradition; and it is natural, or at least once was. In these ways it can be understood in the larger context of early 21st century health care – it is one of thousands of CAM to which consumers are drawn for reasons outlined above. We argue that in other ways noni is exceptional, particularly in its extreme celebrity and versatility of uses.

Historical uses of noni

Before European contact, Polynesian medicine reflected not only the health problems of the time, but also their explanatory disease models. Disease etiologies ranged among, *and combined*, naturalistic and personalistic causes: naturalistic explanations attributed illness to cold, damp, trauma, and dirt; personalistic causes include spirits, breaching *kapu*, loss of *mana*, or rending the fabric of family and community through immoral, sacrilegious, or other antisocial behaviors. Treatments ranged among botanical medicines, massage, sweating, and more specialized treatments engaged by the *kahuna*, the collective repository of traditional knowledge (Chun 1994; Judd 1997; Luomala 1989).

Until the mid-19th century Hawaiian *kahuna* used few internal medicines other than cathartics and emetics. Plant medicines commonly were selected for unpalatable taste and smell to drive away the spirits, gods, and other agents who caused the illness. Noni, the ripe fruit of which is notoriously objectionable, was used throughout Polynesia for this purpose. This idiom underlies the logic of many medical paradigms worldwide: good medicine tastes bad, on the theory that the more unpleasant the treatment, the more potent; further, in some instances, bad taste is regarded to be an integral constituent whose apprehension marks the utility of that medicine. A study that we conducted in the mid-1990s reinforces this meaning of medicines in contemporary Honolulu – e.g., “aromatic, pungent, bitter, or sour qualities are understood to ‘thin and purify the blood’” (Etkin et al 1999:18); and, more specifically, “the repulsive taste and smell of both fresh and fermented noni are consistent with [how diverse peoples] ... in contemporary Hawai‘i apprehend those qualities as signs of special medicinal import, especially metaphors of power and cleansing” (Dixon et al. 1999:65).

The traditional uses of noni in Hawai‘i were a limited number of topical applications for sprains, swellings, bruises, and wounds. In Polynesia and Southeast Asia topical applications of this plant extended to cough, cold, pain, and liver disease; a small number of internal applications existed as well (e.g., for malaria, hypertension, and intestinal worms) (Dixon et al. 1999).

Contemporary uses of noni

The contemporary uses of noni are myriad, ranging across diverse organ systems, and enormously varied therapeutic objectives. An internet search engine instructed to look for noni yielded 182,000 web sites. The first five of those sites yielded the 28 applications shown in the text box on the next page, with considerable repetition.

The biomedical paradigm simply cannot make sense of this diversity of uses. Fair enough, these are not biomedical products. But no folk explanatory model could comprehend this either – these are not all cold diseases, or caused by weak blood, or the result of offended spirits, or due to object intrusion, or any other permutation of indigenous etiologies.

Noni and the market

In view of the still-only-emergent scientific knowledge of noni, what accounts for its popularity? How did it evolve from the obscurity of a few applications in traditional Polynesian medicine to its status as a virtual panacea today? We argue that in the contemporary climate of self-care and the commodification of health, noni's popularity is consumer-based and market-driven. More than 200 commercial entities sell noni products, it is distributed across the globe, and it enjoys an enormous market share.

As for other CAM, product descriptions for noni typically straddle the traditional/natural and modern/scientific continua. Noni is traditional, but also a contemporary medicine for contemporary problems. It is natural, but at the same time purportedly contains the kinds of chemicals that undergird the consumer's confidence in pharmaceuticals. In another mix of science and nature, promotional themes for noni include cleansing, balance, and immune boosting.

The commodification of CAM includes “the appropriation of general healing metaphors as well as the re-fashioning of those themes to render them more transculturally attractive” (Etkin et al 1999:23). Transacting and consuming products that project a specific identity (Tahitian, scientific, “Local”) allows one to try on another culture. For some noni users the cultural icons that connect it to Polynesia are compelling. Other, “kosher” and “kahuna-blessed” noni products both broaden the appeal and speak to other specialized markets. As bioscientific corroboration for noni has not yet been realized, testimonials from established – but not necessarily long-term – users build the consumer's confidence by personalizing the products.

Is noni unique?

Compared to other CAM products, noni has experienced enormous commercial success in a relatively short period of time (more or less since 1996). It also is distinguished in the number and diversity of conditions for which it is promoted. Finally, compared to other very popular botanical CAM – such as garlic (*Allium sativum* L., Liliaceae), neem (*Azadirachta indica* A. Juss, Meliaceae), and aloe (*Aloe vera* (L.) Burm.f, Aloeaceae) – corroborative, science-based information on the healthful qualities of noni does not exist. As colleagues at this conference illustrated, chemical, pharmacologic, and clinical knowledge of noni is still emergent. We are just beginning to understand these aspects, and for a small number of indications it appears that there is some promise.

Conclusion: the future of CAM and noni

The actuality of contemporary health care in the West is a mix of biomedical and self-diagnosis, pharmaceutical management, and self-care. Gradually, allopathic health care providers are factoring CAM into their practices – at minimum raising the issue of CAM during the clinical encounter and, increasingly, using CAM products in conjunction with pharmaceuticals. We enter an age of integrative medicine that draws on diverse therapeutic modalities to create a context for comprehensive prevention and healing. Continuing education and specific university programs that focus on CAM are becoming accessible to physicians and other health care professionals. The University of Hawai'i recently inaugurated a Department of Complementary and Alternative Medicine that will impact the medical curriculum by supporting evidence-based research on, and forging awareness of the diversity of, CAM modalities.

Substantive research on noni is being conducted at a number of research centers, including clinical trials and other investigations in Hawai'i. While it is not likely that this work will corroborate the multiplicity of claims made by noni users today, some of the findings offer promise. Still, it is not likely, that drug discovery will be a proximate, or even ultimate, outcome. As programs of integrative medicine cohere, and CAM use continues

ADD/ADHD	Cancer	Fibromyalgia	Multiple sclerosis
Addictions	Cardiovascular disease	Gout	Muscle and joint pain
Allergies	Chemical sensitivity	Hypertension	Polio
Arthritis	Chronic fatigue	Immune deficiency	Rheumatism
Asthma	Diabetes	Infection	Severed fingers
Brain problems	Digestive problems	Inflammation	Sinus
Burns	Endometriosis	Jet lag	Veterinary medicine

its present popularity, it may be that noni finds its new niche firmly rooted in the functional food market. We may see noni products expanding into the packaged-goods aisle and into the fortified beverage market before we see it on a physician's prescription form or validated in the bioscientific literature. Considering the great momentum and cultural capital that noni has gained thus far, it is likely to be here for a long time.

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