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ETHNOMEDICINE IN MALUKU, EASTERN INDONESIA

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Introduction

The research reported here is part of a comprehensive investigation of medicine, diet, and health in eastern Indonesia. Specifically, we explore the health implications of medicinal plant use by contemporary peoples of Maluku Province, where health care continues to be significantly influenced by the medical traditions of an ethnically diverse population. To date, no systematic field-based research on medicinal plant use has been conducted in eastern Indonesia, and the few studies that exist have generated catalogues of botanicals by function, without efforts to link indigenous plant use with phytochemical constituents or to explore the implications of plant use for human health. By contrast, our research links ethnography to pharmacological action. We report the results of our pilot study. Follow-up studies will amplify this to include laboratory investigation of commonly used medicinal plants.

Theoretical perspective

This work is framed by the theoretical idioms of a human ecology that addresses not only the cultural construction of therapeutics but also the physiologic outcomes of particular therapeutic strategies. This bio-behavioral perspective in medical anthropology comprehends human health as it is affected both by the ideational factors that shape human–environment interactions (e.g., disease models that embody causation and expected outcome) and by the specific consequences of such health-seeking behaviors as plant utilization. In this particular case, the dynamics of human–environment relations are further embellished by the

likelihood of vegetational modification attendant upon changes in the subsistence base.

Scope and personnel

This project is part of a larger interdisciplinary effort that explores transformations of the “sago complex” in eastern Indonesia, and that links the University of Hawai‘i and Universitas Pattimura in a long-term collaborative research endeavor. The combined interests of the larger research team intersect several disciplines—anthropology, botany, food science and nutrition, geography, linguistics, and archaeology.¹

Research significance

Studies of Indonesian flora record varied uses and a marked diversity of species. For example, Ellen’s extensive research on Seram (e.g., 1993a) reveals how indigenous patterns of plant management conserve biodiversity. With that exception, however, little of this research specifically addresses Maluku. More germane, there is no systematic, single-village study that links ideational/symbolic aspects of prevention and therapeutics to the biodynamic potential of medicinal plants. There is thus no way to document the importance of particular botanicals for specific indigenous populations. We cannot assess the significance of plant use for human health.

Research setting

The broader geographic and cultural reference of this study is Maluku Province, a vast archipelago comprised of more than 1000 islands in eastern Indonesia. Seram is the largest of some 15 main islands of the regency (*kabupaten*) of Central Maluku, and home of its administrative capital, Masohi. The island topography features a curving coastline, low hills, and a core of volcanic mountains. The flora and fauna of Maluku are an amalgam of Australian and Asian species (botanicals separated by the Weber Line between Sulawesi and Maluku, and animals by the Wallace Line that extends along the Makassar Strait between Sulawesi and Kalimantan).

The study population

The village of Lohiatala on western Seram Island is located approximately 6.5 km from the coast, on the Nala River, in *kecamatan* (district)

Kairatu.² The people identify themselves ethnically as Alune, although today those traditions are fragmented, judging by such conventional referents as religion, art/decoration, house construction, and the like. The subsistence base is forest-plot horticulture, gathering, and limited hunting. All villagers understand Bahasa Indonesia; many speak Ambonese Malay, the lingua franca of Maluku; and a minority (primarily older residents) continue to use Alune as their primary vernacular. These linguistic features are reflected in plant names, disease nosologies, and the explanatory models that link etiology to therapeutics.

In 1994, there were 145 households (houses) and a total population of 771 (Ng 1995, Lohiatala Household Registry 1994).³ The present study was confined to residents of the large, primary division of the settlement (total village area 2300m²), which is physically dominated by a sizable modern church that embodies this population's firm religious grounding in Calvinist Protestantism, and that defines much of the population's social activities. The village is served by electricity. The installation of piped water was initiated in August 1995, until which time the river was the only water source.

The chief carbohydrate staple is sago,⁴ extracted from the stalk of the sago palm; rice is becoming increasingly important as well. Yams, taro, sweet potato, cassava, beans, maize, groundnut, bitter melon, pumpkin, and soy bean figure prominently among foods cultivated in swidden forest plots, in near-house gardens, and along walkways. Various semiwild and wild plants contribute significantly to diet as well, including spices (e.g., ginger, lemon grass, tamarind), ferns, and mushrooms. Fruit availability (e.g., banana, durian, pineapple) is highly seasonal. Irregular hunting yields deer, cuscus (*Phalanger* spp.), and wild boar. Fish and (less commonly) chicken are purchased at markets (see also Ng 1995, Novotny 1995).

Health care

The use of plants, prayer, and other indigenous medicines is commonplace, despite the fact that the provision of basic biomedical health care has been mandated by the Indonesian government for each *kecamatan*. During the 1980s the Posyandu system formalized and integrated services for immunization, nutrition, family planning, and mother-child health.⁵ Posyandu cadres visit Lohiatala once per month to weigh children, administer vaccinations, and provide vitamins for mothers and

children. Government community health centers called PUSKESMAS (Pusat Kesehatan Masyarakat) expand those services further, but these have a much less significant impact on Lohiatala. The underuse of these and other biomedical facilities—particularly in the remote parts of Maluku—has been attributed in large part to transportation difficulties (cost, irregular availability) and correlates with lower levels of formal education, especially among women/mothers (Douglass 1984, Sugiono et al. 1991). Throughout Maluku, traditional birth attendants in particular figure more prominently than their biomedical counterparts, in part because of their proximity to the women who enlist their assistance (Robinson & Sugiono 1992). In addition, botanical treatments may be selected over biomedical health care because of the high cost of pharmaceuticals, because village medicines (*obat kampung*) are perceived to be more effective for certain conditions, or because biomedicine has failed to resolve a health problem.

Data collection—strategy and methodology

Research was conducted during July and August 1995 to document the circumstances of health and healing, and plant knowledge, in Lohiatala. The specific methods employed conform to the standards set for ethnographic and ethnobotanical inquiry (Alexiades & Wood Sheldon 1996, Bernard 1994, Cotton 1996, Etkin 1993, Martin 1995).

Three preliminary methods were employed: key respondents (in conjunction with literature review and lexical analysis), observation, and focus groups. These were the focus of efforts for the first week, and were also invoked irregularly later in the course of study. The strategy by which the bulk of data were collected concentrated on intensive interviews and the collection of botanical voucher specimens. For these sustained methods, unstructured interviews centered on the identification and description of commonly used plants and their medicinal (and other) applications. Data collection was organized around several protocols: (1) interviews that focused on plants, for which respondents described medicinal, dietary, and other uses. This was cross-indexed with (2) interviews that drew on diseases and symptoms for which respondents described etiology, pathology, social and cultural significance, relative susceptibility, and preventions and treatments. These latter include identification/selection criteria, preparation, mode of administration, dose, and expected outcome. Finally, (3) ecological inventories determined

growing conditions and availability of plants, supplemented by observations at markets and interviews with medicine providers/sellers to determine other (social and cultural) features of availability.

As the study advanced, a list of specific medicines and illnesses was distilled from the larger data set, and a fixed interview instrument was created to address the most common medicines used, the symptoms or diseases so treated, and overlapping contexts of use (e.g., medicine and food, medicine and cosmetics). These follow-up interviews amplified the ethnographic base, and served in part to corroborate the substance of earlier discussions. Interviews were conducted in Bahasa Indonesia, with occasional assistance from villagers to translate from Ambonese Malay and Alune.⁶

Voucher samples were collected for 68 of the plants. These dry, pressed samples were reviewed at the Bogor Herbarium, with permissions from the Government of Indonesia, and exported to the U.S., where they were identified at Harvard University's Arnold Arboretum and the University of Hawai'i's Lyon Arboretum.

A photographic record of both the plants discussed and the voucher specimens extends our documentation of the pharmacopoeia and foods of Lohiatata. Photo duplicates were deposited at the Bogor Herbarium. Research permissions and other government approvals were secured for all phases of the research.

Study participants

Judgment sampling was used to identify key respondents who are knowledgeable about health, healing, and diet, and convenience presented individuals with no recognized expertise who were interested in talking about common complaints and medicines used in "self-care" ("homecare"). Thirty-nine villagers were interviewed—26 men and 13 women—representing the relatively narrow range of social, economic, and demographic variability in Lohiatata. Of these, ten women and six men were interviewed on a repeated basis. A smaller number of specialists so recognized throughout the village were also interviewed: four midwives (*mama biang*, all women); four men who specialize in Christian prayers and/or Alune and Ambonese Malay secret word formulae (*kata-kata*, see below); and one elderly man (near 70 years old) who treats a wide range of disorders including malaria, childhood systemic diseases, and various conditions for which there exist no clear biomed-

cal analogues. The remaining respondents were invited, or volunteered, because they are regarded as especially capable in treating particular ailments or because of their knowledge of certain plants and compound medicines that require elaborate preparation.

These individuals formed the nuclei of loosely consolidated focus groups that addressed such issues as health concerns in the peripartum, the etiology and treatment of malaria, food and medicine, prayer and healing, and the identification and collection of plant medicines and foods.

We were instructed in the local botanical vernacular principally by four men and two women who are generally regarded to have the most, and greatest range of, knowledge. They identified plants—providing synonyms and information about conditions of growth and seasonal availability—in gardens, within the village proper, and throughout surrounding forested areas within a radius of about 2.5 km from the village center.

Additionally, village leaders—the Kepala Kampung (Village Head), Kepala Adat (Traditional/Customary Head), and the current and former Sekretaris Desa (Village Secretary)—provided valuable information about the history of Lohiatala, changes in therapeutic practices over time, and epidemiological transitions. The village preacher, a very influential resident who is intimately involved in all village affairs, and his wife were important sources of knowledge about local therapeutics and diet. Two government health workers and one physician who visit Lohiatala once a month on the Posyandu program were interviewed about the current epidemiological landscape and approaches for meeting health needs of the study population. Two teenage boys assisted in plant collection and added further—and in some ways unique—insights, primarily on plants used in the treatment of wounds.

Results

The recognition and definition of illness

Among health concerns reported by Lohiatala residents, the most prominent are respiratory infections, diarrheal diseases, malaria, intestinal worms, skin infections, perinatal conditions, and children's diseases. Similar epidemiologies have been reported elsewhere in the immediate region (e.g., Effelsberg 1985). Posyandu cadres concur and note diarrhea

and coughs with runny noses as among the most common childhood illnesses. Interviews centered on all these disorders. Several are discussed below to instruct across the range of variability and to suggest patterns of disease definition.

Respiratory illnesses include, for example, *hosa* (probably asthma), *batuk* (cough), *batuk gatal-gatal* (itching cough), and *meludah darah* (spitting blood/hematemesis). Diarrheal diseases include *menceret* (simple diarrhea) and the more serious *muntaber* (literally, a combination of *muntah/vomit* and *berak/diarrhea*, often referring to cholera). Intestinal parasites include worm infections such as *cacing pita-pita*, which causes one to become pale, thin, and listless.

Lohiatala residents identify malaria (*penyakit malaria*) by the intermittent fevers that are recognized by diverse medical cultures as the signature of plasmodial infection. As does biomedicine, Lohiatala residents include jaundice (*sakit kuning/yellow illness*) among symptoms that can accompany malaria. *Sakit kuning* may also be the consequence of too much exertion and inattention to one's health. Certain individuals are predisposed to *penyakit malaria* because they have a *bibit* (seed) for it in their stomach. *Biji poro* (a stomach stone) is also part of the malaria symptom complex. Like *sakit kuning*, *biji poro* can occur on its own, and as part of the symptom complex of other diseases. When *biji poro* is on the left side of the stomach, it is diagnosed as malaria; its biomedical analogue is spleno/hepatomegaly. Other symptoms of *penyakit malaria* include chills, headache, vomiting, and red urine. Older individuals are vulnerable to malaria if they do not eat enough and if they experience *masuk angin* (see below). Malaria occurs more commonly during the fruiting season, February to April, and may result from drinking unboiled water from the river. If one already harbors the malaria "seed," drinking the water of a young coconut can provoke symptom expression.

Sawang is a cold condition, usually caused by morning baths in the river, which sucks blood from the stomach. Women in the seventh to eighth month of pregnancy are particularly vulnerable. The symptoms of *sawang* include stomachache, vomiting, and pale, dry lips; left untreated, it can eventuate in *sakit kuning* or *bengkak* (see below).

As is the case in other areas of Indonesia, residents of Lohiatala discern a relatively elaborate nosology for skin diseases. *Upas gatal* is a condition of itching skin that eventuates in reaction to the consumption of some foods, such as sago grubs and certain fish. The eruptions vary in

size. *Kudis-kudis* describes small spots that itch a great deal and, after being scratched, become tropical ulcers. *Boba* are flower-shaped pustules or boils that may cover the body, produce large quantities of pus, and/or evolve into tropical ulcers. Food reactions, as well as inoculations/immunizations, are invoked in the etiology of *boba*, as they are for *upas gatal*. *Nuamang*, on the other hand, is hereditary and characterized by small, weeping spots that itch severely; it is more likely to be treated by word formulae or prayer (see below). The description of *kurap* evokes classical ringworm—a disk, then ring, of infection with a healing center, which occurs on scalp and/or skin and itches, eventuating in scaly debridement. This condition is further differentiated into a more severe type, *kaskadu*, in which the skin resembles a mushroom/fungus (*jamur*) and may not be patterned in rings. Flowers are invoked again to describe a white variety of *panu*, a ring rash that resembles in biomedicine the inflammations (marking follicular plugging with hair material) of black-dot ringworm.

People of Lohiatala regard pregnancy, and indeed the peripartum generally, as medically unremarkable. Whereas the potential for difficulties is recognized during pregnancy, childbirth, and the first 30–40 days postpartum, as in most of the developing world, child-bearing has not been medicalized to the extent that it has been in the West. There is no heightened seeking of health care, few if any changes in diet, and little anxiety. Among the few conditions that do concern Lohiatala residents, *darah putih* (white blood) engenders the most apprehension. This is an infirmity that women experience if dirty blood is not cleaned out of the womb after childbirth; in that case, it can rise to the head and effect a very debilitated state. Alarming as *darah putih* is on its own, a greater worry attends its progression into more severe symptoms, and even other diseases and death, and it impairs the mother's ability to care for her children.

Another condition of debility for both men and women is generally glossed as *bengkak*. It is most common among people aged 50 years and older who, having expended much energy over the course of their lives, are understood to have less blood and less warmth in their bodies. Biomedical analogues may be anemia and congestive heart failure. Key symptoms are edema (*bengkak* can be translated as swelling), weakness, dizziness, an abundance of *darah putih* (in this instance, literally “white

blood”), pale skin, and shortness of breath. The condition occurs or is exacerbated by cold or “dirt” in the stomach.

Children’s diseases include *serampah* (probably measles), an acute spot disease identified in the presence of a red (nonproductive) rash that starts on the head and moves to the trunk and extremities, accompanied by fever, eye discharge, and cough. *Step*, another disease of small children and babies (particularly males), is identified by paroxysmal tensing/rigor of the body; it may occur coincident with fever and is clearly distinguished from epileptic convulsions (*mati-mati ayam*).

Metaphors of health and healing in Lohiatala

In general, people in Lohiatala divide illnesses into two categories: those that trace their etiology to natural phenomena, and those attributed to sorcery (the malevolent actions of other people) and extrahuman agency. This nosology finds parallels in other parts of Seram (e.g., Ellen 1993b). Mawe describes the manner in which a specialist looks at a sick individual to determine whether the illness can be ascribed to natural causes or sorcery.

Masuk angin *and* panas/dingin

The central naturalistic–personalistic paradigm is compounded through reference to several organizing principles that further refine local perceptions of illness. As in other parts of Indonesia, *masuk angin*, wind entering the body, describes the etiology of a wide range of disorders.

The metaphor invoked here is the transgression of a barrier that protects the body interior (vulnerable, intimate, self) from the outside (powerful, unknown, other). This overlaps significantly a hot–cold (*panas/dingin*)⁷ binary opposition, an overarching principle that conceptualizes a dynamic equilibrium in which harmony defines health, while imbalances engender infirmity and misfortune. Residents of Lohiatala variably divide illnesses and therapies between *panas* and *dingin* in a pattern that may or may not bear on the actual thermal state—that is, the assignation of hot or cold is rendered symbolically. In the simplest construct, cold diseases must be prevented and treated with hot therapies, and vice versa. Therapies can be compounded to achieve the appropriate balance, and the endorsement of new medicines (including pharmaceuticals) depends in part on their perceived valence with respect to *panas/dingin*. Several examples follow.

In Lohiatata, cold is invoked in the etiology of several elements of the malaria symptom complex. Intermittent fevers result from drinking unclean, cooling water; jaundice can occur due to overexertion and loss of heat from the body interior; and splenomegaly may develop if one washes in cold water.

The childhood illness *serampah* (measles) is caused by *masuk angin* during the season that local trees bear fruit (February–April). Medicines are applied topically to this hot disease to encourage the heat to rise. Wearing a red sarong also will dissipate the heat of this illness. *Luti-luti air*, another children's febrile spot disease (but vesicular), also is classified as hot and shares therapeutic objectives and medicines with *serampah* (with the exception of the red sarong). Cold also is a primary feature of the etiology of *bengkak*, treatments for which focus in part on redressing that imbalance. Conversely, *step* is caused by internal heat which, on exiting through the head, results in the rigor that is the signal feature of this disease. Therapy for *step* involves rubbing the baby's mouth with soy sauce and garlic, rubbing a mixture of coconut oil and red onion around the eyes, or rubbing onion and shrimp paste around the rectum and nose. Such measures draw heat out through these portals, assuring disease egress.

The common cough is treated with various medicines, including compound medicines, such as egg yolk, honey, and lime, or leaves of *papari*, shallots, and salt. The first is the preferred cough therapy, but with the precaution that if the patient is hot/feverish, the egg yolk should not be included because it is itself considered to be hot.

Blood and contamination

The antecedents of *bengkak* and malaria evoke metaphors of dys-nuturance and a generalized pollution/contamination. The etiology of diarrheal disorders includes the accumulation of dirt/contaminants. Intestinal worms are more a literal than metaphoric contaminant and are drawn out of the body by application to the stomach of warmed leaves, such as *bengkudu*. Pollution via specific foods can cause skin diseases such as *upas gatal* and *boba*. Explanations of *darah putih* and *bengkak* both are projected on a metaphoric framework that centers on blood, especially insufficiency. The contamination of blood offers a compound, and especially potent, metaphor for explaining serious illnesses such as *darah putih*.

The therapeutic power of bitterness/astringency

Many of the plant medicines used in Lohiatala are remarkable for bitter and astringent tastes, which are understood to mark therapeutic efficacy: bitterness strengthens the blood, astringency is understood to expel “dirt,” at least in the case of diarrhea. Bitter medicines, such as decoctions of *picah piring*, are commonly used to treat intestinal worms. Most malaria medicines include bitter elements, such as the leaves of *pepaya* and *pule*. Diarrheal diseases such *buang-buang air* are commonly treated with bitter or astringent plants: leaves of guava and clove or nutmeg are decocted into a strong astringent/bitter medicine; or astringent raw cassava is eaten. Other astringent plants shrink the uterus after childbirth and clean the stomach.

Signatures

In Lohiatala the selection of some medicinal plants is guided by a “doctrine of signatures.” In other words, the use of a plant is revealed in its unique configuration of physical attributes such as color, location, texture, and shape. For example, jaundice is treated with the yellow, mature leaves of breadfruit. Childbirth is hastened by medicines that incorporate slippery constituents—raw egg, leaves of kapok, or *pohon baru*. A shampoo containing the long leaves and (hairlike) roots of *rumput kuda* thickens the hair. *Menumpang* (lit. ‘to join with, ride on’) is a vinelike parasite that attaches itself to a tree and eventually kills it. For residents of Lohiatala it evokes tumors that kill their hosts, and people use its leaves in the prevention and treatment of cancerous and other growths.

Plant medicines

Symbolically rich and compelling though they are, signatures and other metaphors of healing are not the only selection criteria for medicines. The efficacy of plants also lies—and is so identified—in their pharmacological activity. Indeed, signatures may be the mnemonic tools that identify plants with observed physiologic efficacy (Etkin 1993, 1996).

There are a few specialists (described above) whose knowledge of botanical medicines ranges widely, and most residents of Lohiatala are familiar with some smaller number of common plant medicines. During the course of this preliminary study, 94 plants were discussed in detail, focusing principally on medicinal uses. At present, ethnographic and

botanical data are being entered into a database that cross-indexes plants, phytochemical and botanical data, uses, preparations, and expected outcomes. For future studies, an extensive literature search will be conducted through NAPRALERT (Natural Products Alert Database). This unique natural products database distills the world literature on the pharmacology, ethnobotany, and chemical constituents of plant parts and extracts. The computerized format of NAPRALERT data permits the articulation of pharmacological, botanical, and ethnographic data. Further analysis will engage permutations of these data categories to test hypotheses about the relations between the ideational and pharmacodynamic nature of medicinal plants in Lohiatala.

Christian prayer, *kata-kata/tiup-tiup*

For certain diseases associated with high mortality (*tbc*/tuberculosis, *kanker*/cancers, and other growths), for particularly alarming symptoms (e.g., hematemesis), and for conditions of any etiology that are intractable to other treatments, the preferred therapy is elicited from a village practitioner who employs Alune and/or Ambonese Malay secret word formulae, *kata-kata*, and/or Christian prayer. These personal/secret recitations may invoke ancestors. *Tiup-tiup* (lit. 'to blow wind') involves blowing on a patient. The healer might also blow and pray over water that the patient will drink. *Tiup-tiup* can include plants—commonly red ginger, which is chewed by the healer and sprayed from his mouth onto the patient. Symptom resolution may require more than one sequence of *kata-kata/tiup-tiup*, up to seven times before the patient recovers.

Over time, *kata-kata* and *tiup-tiup* have been displaced by Christian prayers, *sembayang* or *doa*, which also can be accompanied by botanical therapies. This transformation of indigenous medical beliefs and therapeutics is invoked by the Alune phrase, *A menare ite pae mleru, mpae muli meije ami subaie* 'Formerly we used the blowing in healing ritual, now we pray' (Boulan-Smit 1992, working in another Alune village of West Seram).

The multicontextual use of plants

There is significant multicontextual use of plants in Lohiatala—most dramatically, 42% of the common medicinals are used as well in diet. A few examples are instructive. Components of betel packs (areca fruit/*pinang*, slaked lime/*kapur sirih*, betel pepper fruit, and occasionally

tobacco/*tembaku*, all wrapped in the leaf of betel pepper/*daun sirih*) are common ingredients in compound medicines, as well as a virtual backdrop of social relations—as one observes elsewhere throughout Southeast Asia (e.g., Ellen 1991). Components of the betel pack are often included in compound medicines, along with popular culinary spices such as ginger, garlic, shallot, galingale, and turmeric. Various parts of the sago palm are included in a wide range of medicinal preparations. The leaves of the medicinal *hanua* are cooked with meats in order to preserve the meat or to rid it of odor when it has gone “off.” Other contexts of use that overlap medicines include cosmetics (e.g., the juice of medicinal *laka* is used to color fingernails red) and manufacture (e.g., the leaves of rattan are used to fabricate mats and umbrellas, and occur in several compound medicines).

Obat kampung and obat rumah sakit
(Village medicine and hospital medicine)

The importance of local preventive and therapeutic modalities is underscored by the observation that the use of medicinal plants continues sometimes to the exclusion of, but more commonly in conjunction with, biomedicine/pharmaceuticals. Such syncretic medical paradigms have been widely reported worldwide (Etkin & Tan 1994, Etkin, Ross, & Muazzamu 1990, Haak & Hardon 1988, van der Geest & Whyte 1988), and have been formally recognized in other parts of Indonesia where government health policies promote the use of traditional medicines that have already proven to be effective (Esche 1989, Hargono 1993).

As noted above, prayer and word formulae are the treatments of choice for intractable and otherwise very serious illnesses. Other diseases that also respond only to *obat kampung* include illnesses ascribed to sorcery or perplexing etiologies. Similarly, people of Lohiatala eschew biomedicine when disease etiology is linked to sorcery, and when issues of cost, convenience, or shame (e.g., in the case of venereal diseases) intervene. Some local medicines cannot be compounded with pharmaceuticals because the combination is too powerful. This applies especially to *belanga*, which is itself a compound of 9–12 plants. In other cases, biomedicines and traditional medicines are used concurrently or serially. Malaria that has not been successfully treated with chloroquine or mefloquine, *penyakit malaria sudah tua*/old malaria, is treated with the bitter liana *antawali*. *Darah putih* that has not been resolved after

several months is no longer regarded as responsive to biomedicine. Before one seeks biomedical treatment for the “hot” illness *step*, one must first use local medicines in order to draw out the heat. As is common wherever biomedicines have been introduced in the context of other therapeutic paradigms (Etkin & Tan 1994), in Lohiatala pharmaceuticals may be used via different modes of administration and for conditions other than those indicated by the drug manufacturer. For example, people apply the powdered contents of tetracycline capsules to the umbilicus of newborns in place of the traditional powdered nutmeg, and bitter chloroquine tablets may be used as abortifacients.

Conclusions and future directions

We have reviewed the methodology and preliminary results of a study of medicine, diet, and health in Lohiatala village, West Seram. Our observations center on key metaphors that define health and how those are linked to traditional, primarily botanical, therapeutic paradigms.

This work is conceived as a foundation for continued research in West Seram. Beyond the research conducted in 1995, we will deconstruct the complexity of our larger database (the botanical pharmacopoeia of Lohiatala) by problematizing inquiry to specific questions, and by using cultural data to focus attention on some subset of those plants, such as those related by use for a particular illness, by use as both medicine and food, and the like. Future studies will include more of the senior residents of Lohiatala whose linguistic exclusivity (Alune or Ambonese Malay) restricted their participation in the present study and because they are the more likely to reside seasonally in Lohiatala Lama (Old Lohiatala) and thus were not present during our residence in the village. Their inclusion will be especially important for identification of intergenerational differences in the conceptualization of health and healing, which are common (anecdotal) knowledge but were not apparent in the present, preliminary study.

Overall, our objective is to understand how the patterning of plant use in medicine and diet, compounded by the growing influence of biomedicine, shapes local perceptions of health and the physical experience of illness in Lohiatala, West Seram.

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NOTES

1. The coordinator for the larger project is Pak Frederick Rumatu of Universitas Pattimura. For this field research, Prof. Nina Etkin of the University of Hawai'i is principal investigator; Lisa Gollin of the University of Hawai'i is research associate; and Doksy Binnendyk and Hermien Sospelisa of Universitas Pattimura contributed to the study.
2. Language and the sociohistorical circumstances of linguistic transitions in Lohiatala have been described by Florey (1990).
3. More recent *kecamatan* figures are not available; our in-village assessments were less accurate, in view of the interrupted patterns of residency for portions of the population.
4. Botanical identifications are presented in the Appendix.
5. In the past, these services had been decentralized, offered piecemeal and through different (and sometimes competing) sectors (Mboi 1996, Soekirman et al. 1992).
6. Local terms presented in this paper reflect this polyglot of Bahasa Indonesia, Ambonese Malay, Alune, and occasionally Dutch and English.
7. The contrasting terms are separated here by a slash (/) to distinguish them from a specific disease named *panas-dingin*.

Appendix: Botanical identification of plants mentioned in text

VERNACULAR	BOTANICAL TAXONOMY
<i>Antawali</i>	<i>Tinospora crispa</i> Hook.f., Menispermaceae
Banana/ <i>pisang</i>	<i>Musa</i> sp., Musaceae
Beans, e.g.	
Cowpea/ <i>kacang panjang</i>	<i>Vigna unguiculata</i> Walp., Fabaceae
Mung bean/ <i>kacang hijau</i>	<i>Vigna radiata</i> R. Wilczek, Fabaceae
<i>Bengkudu</i> /Indian mulberry	<i>Morinda citrifolia</i> L., Rubiaceae
Areca nut	<i>Areca catechu</i> L., Palmae
Betel pepper	<i>Piper betle</i> L., Piperaceae
Breadfruit/ <i>buah sukun</i>	<i>Artocarpus altilis</i> Fosb., Moraceae
Cassava	<i>Manihot esculenta</i> Crantz, Euphorbiaceae
Clove	<i>Syzygium aromaticum</i> Gaertner, Myrtaceae
Galingale/ <i>cangkor</i>	<i>Kaempferia galanga</i> L., Zingiberaceae
Garlic/ <i>bawang putih</i>	<i>Allium sativum</i> L., Liliaceae
Ginger/ <i>halia</i>	<i>Zingiber officinale</i> Rosc., Zingiberaceae
Groundnut	<i>Arachis hypogaea</i> L., Fabaceae
Guava	<i>Psidium guajava</i> L., Myrtaceae
<i>Hanua</i>	<i>Macaranga</i> spp., Euphorbiaceae
Jackfruit/ <i>nangka</i>	<i>Artocarpus heterophyllus</i> Lam., Moraceae
Kapok/ <i>kapok</i>	<i>Ceiba pentandra</i> Gaertner, Bombacaceae
<i>Laka</i>	<i>Lawsonia</i> spp., Lythraceae
Lemon grass/ <i>serai</i>	<i>Cymbopogon citratus</i> Stapf, Poaceae
Lime	<i>Citrus aurantifolia</i> Swingle, Rutaceae
Maize	<i>Zea mays</i> L., Graminae
<i>Menumpang</i>	Loranthaceae
Nutmeg	<i>Myristica fragrans</i> Houtt, Myristicaceae
<i>Papari</i> /bitter gourd	<i>Momordica</i> spp., Cucurbitaceae
Papaya/ <i>pepaya</i>	<i>Carica papaya</i> L., Caricaceae
<i>Picah piring</i>	<i>Clerodendron</i> sp., Verbenaceae
Pineapple/ <i>nanas</i>	<i>Ananas comosus</i> Merr., Bromeliaceae
<i>Pohon baru</i>	<i>Hibiscus tiliaceus</i> L., Malvaceae
<i>Pule</i> /dita bark tree	<i>Alstonia scholaris</i> R.Br., Apocynaceae
Pumpkin	<i>Cucurbita</i> spp., Cucurbitaceae
Rattan	<i>Calamus</i> and allied genera, Palmae
Rice	<i>Oryza sativa</i> L., Graminae
<i>Rumput kuda</i> /horse grass	Poaceae
Sago/ <i>sagu</i>	<i>Metroxylon</i> spp., Palmae
Shallot/ <i>bawang merah</i>	<i>Allium cepa</i> L., Liliaceae
Soy bean	<i>Glycine max</i> Merr., Fabaceae
Sweet potato	<i>Ipomoea batatas</i> Lam., Convolvulaceae
Tamarind/ <i>asem Jawa</i>	<i>Tamarindus indica</i> L., Fabaceae
Taro	<i>Colocasia esculenta</i> Schott., Araceae
Tobacco	<i>Nicotiniana tabacum</i> L., Solanaceae
Turmeric/ <i>kuning</i>	<i>Curcuma longa</i> L., Zingiberaceae
Yam	<i>Dioscorea</i> spp., Dioscoraceae

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