

ALUNE ARACHNOPHAGY AND APPROACHES TO SPIDERS AMONG AN EASTERN INDONESIAN PEOPLE

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ABSTRACT.—Despite the close association between spiders and human communities, ethnobiologists and anthropologists have paid little attention to knowledge and use of spiders. This paper briefly reviews ethnographic information on human-spider interactions. We contend that spiders are intrinsically no less edible or otherwise useful than many other arthropods, and that the lack of reporting on spiders in the ethnobiological literature may reflect inattention on the part of observers rather than actual indigenous non-utilization of a potential resource. The paper then provides an example of ethnobiological knowledge and use of spiders among the Alune-speaking people of Seram Island, eastern Indonesia. Several Alune taxa of spiders are considered edible. While their contribution to the diet is undoubtedly minor, we suggest that spider eating is an element of a 'small foods' tradition of a mixed horticultural and foraging subsistence-oriented economy. Knowledge and use of spiders are components of Alune identity as forest-dwelling people, and of traditional patterns of livelihood that retain relevance in the contemporary context of widespread social unrest. The Alune example suggests the possible value of attention to spiders as dietary and medicinal items in the subsistence strategies of other indigenous cultures.

Key words: Alune, Seram, arachnids, entomophagy, ethnozoological classification.

RESUMEN.—A pesar de la estrecha asociación entre las comunidades de arañas y las humanas, los etnobiólogos y antropólogos han dedicado escasa atención al conocimiento y uso de las arañas. Este artículo revisa brevemente la información etnográfica sobre interacciones entre humanos y arañas. Sostenemos que las arañas no son intrínsecamente menos comestibles, o útiles en otros sentidos, que muchos otros artrópodos, y que la ausencia de información sobre las arañas en la bibliografía etnobiológica puede reflejar más una falta de atención por parte de los observadores que un desuso real por los indígenas de este recurso potencial. El artículo proporciona seguidamente un ejemplo de saber y utilización etnobiológica de las arañas por los hablantes Alune de la Isla de Seram, en el este de Indonesia. Varios taxones Alune de arañas se consideran comestibles. Si bien su contribución a la dieta es sin duda secundaria, sugerimos que la ingestión de arañas es un elemento más de una tradición de "pequeños alimentos" dentro de una economía mixta de horticultura y recolección orientada a la subsistencia. El conocimiento y el uso de las arañas son componentes de la identidad de los Alune como habitantes del bosque, y de unos patrones tradicionales de vida que mantienen su relevancia en el contexto actual de inestabilidad social generalizada. El ejemplo Alune sugiere la posible importancia del estudio de las arañas como

elementos alimenticios y medicinales en las estrategias de subsistencia de otras culturas indígenas.

RÉSUMÉ.—En dépit du fait qu'araignées et êtres humains cohabitent, ethnobiologistes et anthropologues ont rarement étudié la conception qu'ont les indigènes de ces insectes et comment ils les utilisent. Cet article examine brièvement nos informations ethnographiques relatives aux interactions entre êtres humains et araignées. A notre avis, les araignées sont fondamentalement aussi comestibles et aussi utiles que beaucoup d'autres arthropodes. Le manque d'études ethnobiologiques consacrées à ce sujet est probablement dû plus à l'indifférence des observateurs qu'à l'absence véritable d'utilisation de ces insectes par les indigènes. Cet article présente ensuite un exemple d'exploitation et de connaissance ethnobiologiques des araignées par les habitants de langue Alune de L'île de Séram en Indonésie orientale. Plusieurs taxons d'araignées sur le territoire des Alune sont considérés comme comestibles. Leur contribution au régime alimentaire est certainement mineure. Nous suggérons cependant que du point de vue alimentaire, les araignées font partie des "nourritures accessoires" traditionnelles d'une économie de subsistance mixte cueillette/horticulture. La connaissance et l'exploitation des araignées font partie de l'identité des Alune en tant qu'habitants de la forêt et des schémas traditionnels de moyens d'existence qui sont toujours importants dans le contexte contemporain d'une agitation sociale diffuse. L'exemple des Alune suggère que des études devraient être consacrées à la fonction alimentaire et médicinale des araignées dans les économies de subsistance d'autres cultures indigènes.

INTRODUCTION

Spiders often live in close association with humans, and are variously objects of interest, danger and aversion. Few ethnobiologists, however, have paid much serious attention to human knowledge of, and interactions with spiders. As a contribution towards an ethnographic understanding of human-spider relations, this paper documents the uses and ethnotaxonomy of spiders among the Alune people of Seram Island in Indonesia.

It is now widely recognized in the anthropological literature that insects have formed an important part of the diet of human communities in many parts of the globe. Academic attention to the consumption and other uses of insects has been subject to the filtering lenses of Judaeo-Christian traditions and European gastronomy, which, with a few celebrated exceptions (honey, crayfish and *escargots* come to mind), eschew the consumption of non-marine invertebrates and their products. The Biblical vision of John the Baptist living a wandering existence in the desert, subsisting on locusts and wild honey, is a symbolic representation of his separation from the established social order. His diet combines the sublime honey, a pure insect product of nature, with a notionally inedible insect, which is, furthermore, inimical to subsistence in the Middle East through its plague attacks on crops. European observers of the subsistence habits of other peoples have tended to assume that the consumption of insects is an indication of destitute circumstances, such as The Baptist voluntarily endured, rather than a matter of choice. As Sahlins (1972:2ff) has pointed out, this ethnocentric view contributed

to the long delay in realizing that a hunter-gatherer existence was by no means as harsh as had been presumed.

There is abundant evidence that in various times and places, insects have achieved an important place in patterns of human exploitation of the environment (Bergier 1941; Bodenheimer 1951; Menzel and D'Aluisio 1998; Meyer-Rochow 1978/79; Posey 1986). Among horticultural people in particular, there is an often detailed knowledge of the biology and ecology of insects which are pests of crops (Posey 1986).

Insects and other terrestrial invertebrates figure widely in the everyday diet in many societies with subsistence-oriented economies (e.g., Bodenheimer 1951; Meyer-Rochow 1976; Posey 1986). In many instances, insects form an occasional or incidental part of the diet (e.g., Setz 1991), but are relished as side dishes (e.g., Ruddle 1973).

Insects are often consumed in particular by children and women, as among the Kapauku of Irian Jaya (Pospisil 1963), Aché of Paraguay (Hill and Hawkes 1983) and Tukanoa of Columbia (Dufour 1987). This restriction by age and gender itself is suggestive of the relatively low status generally assigned to most insect foods.

In other cases insects may be highly esteemed as feast food. In these instances, the particular species so regarded are usually only seasonally or periodically available, such as the bogong moths (*Agrotis infusa* Lepidoptera-Noctuidae) of highland southeast Australia (Flood 1980). Often, they are soft-bodied forms, especially the immature stages of growth, as in grubs of certain beetles, such as the 'sago beetles' (Curculionidae), which are widely consumed in Melanesia and Southeast Asia, and bruchid beetle larvae (Bruchidae) of Amazonia (e.g., Dufour 1987; Ellen 1993b; Ernst 1978; Ruddle et al. 1978).

Aside from the nutritional value of grubs, which are high in protein and fats (Dufour 1987; Ruddle et al. 1978:59), it is perhaps of significance that insects which feature as prestige foods are mostly pupating or burrowing forms, found in conveniently large numbers massed together either in the earth, encased in nests or cocoons, or in the moist pulpy interior of stems, fruit or rotting logs. The symbolic associations between such grubs and cultural representations of human sexuality have been explored by anthropologists (e.g., Ernst 1978; Gell 1975). And, of course, honey is also esteemed in many cultures for its qualities of taste, texture, and its symbolic properties (Levi-Strauss 1973; Posey 1983).

Various insects have been recorded to have other uses, including therapeutic and hallucinogenic applications (e.g., Britton 1984; Groark 1996) and as sources of poisons, as among the Kalahari 'Bushmen' (San), who use exudate from the larvae of the Chrysomelid beetle *Diamphidia simplex* as arrow poison (Silberbauer 1981:76, 207). In New Guinea the brilliantly colored shards and heads of scarab beetles (Scarabaeidae) are threaded on sticks as headdress decorations, valuables and trade items (e.g., Healey 1990:70, 135, 366; Meyer-Rochow 1978/79). Posey (1986) briefly reviews the place of insects in myth, folktales and ritual practice in 'tribal' cultures.

While there are numerous references in the literature to insects, there has been much less attention to knowledge, consumption and other uses of spiders. In some instances, this may be a product of the folk categories employed by

ethnographers themselves. In scientific terms, 'insects' and 'spiders' are subcategories (along with crabs, centipedes and their allies) at different taxonomic levels within the phylum Arthropoda, the largest phylum in the animal kingdom—organisms characterized by a hard outer skin with flexible joints, bilateral symmetry and a segmented body with paired limbs. Spiders constitute a single order Araneae within the class Arachnida (which includes related orders of scorpions, mites and ticks, harvestmen, etc.). Insects, on the other hand, are classified into many orders, which in turn are distributed in several classes grouped into the superclass Hexapoda. There is clearly no close equivalence between the English-language categories of 'insect' and 'spider' and the scientific classification of these arthropods. For some, 'insects' and 'spiders' are distinct and roughly equivalent categories, while for others, the folk English category 'insect' may include 'spiders'. While the terms appear to be employed in a scientifically technical sense in many reports it may be that English-speaking investigators have actually failed to elucidate the boundaries of ethnotaxa glossed as 'insects'. In at least some cultures, besides the Alune case discussed further below, spiders nonetheless constitute distinctive recognized zoological and linguistic categories (see, e.g., Ellen 1993b on Nuauulu; Hunn 1977 on Tzeltal; Posey 1981 on Kayapo; Taylor 1990 on Tobelo; also, Healey elicited similar responses from Maring in 1974).

Spiders are commonly objects of mild unease to acute fear in Anglo-European culture. Arachnophobia is a recognized psychological disorder, and negative representations of spiders appear widely in European folktales, literature, film and children's stories. Spiders and their webs have a prominent place in the European iconography of horror.

Many cultures appear to share the ambivalent attitude towards spiders of Western European cultures. Spiders are widely regarded as objects of fear, aversion or as pests. The fact that many spiders have painful, poisonous, and even potentially lethal bites no doubt contributes to the common anxiety many people feel towards spiders.

However, most spiders are no less intrinsically edible or otherwise useful than many other arthropods and insects which are widely eaten in many subsistence-oriented societies. Hunn (1990:167ff) is the only source we have found which specifically notes that spiders are *not* eaten, in this case (along with most other invertebrates), by the Sahaptin Indians of the Columbia Plateau. There are very few explicit references in the ethnographic literature to the edibility of spiders, or to other uses to which they are put. The following section reviews the available record.

In the absence of clear attention to the issue of the utilization of spiders by human cultures we are led to ask: Does the lack of information on the use of spiders for food or other purposes reflect widespread non-utilization of this potential resource, or is it a consequence of inattention on the part of ethnobiologists to actual indigenous practices in relation to spiders?

ETHNOGRAPHIC RECORD OF USE OF SPIDERS

The negative attitudes to spiders outlined above is by no means universal. There are a few scattered reports in the literature of spiders being used for food,

medicinal practices, as providing raw materials for items of technology, and as positive markers of social identity.

In his world survey of the use of insects as food, Bodenheimer (1951:65, 67–68) also briefly reviews the use of spiders as food and for medicinal or magical purposes, citing a number of sources from the eighteenth century onwards. Bodenheimer's data are fragmentary. The ethnicity or location of spider-users is not always clearly identified. Meyer-Rochow's more recent survey (1978/79) suffers from the same defects. Bodenheimer reserves greatest attention to cases of arachnophagy in Europe, perhaps out of a sense of the grotesque. It is clear from his account that instances of spider-eating attributed to particular individuals in eighteenth- and nineteenth-century France and Germany are "perversion[s] of taste" (Bodenheimer 1951:65), rather than common cultural practice. Several of these arachnophagists likened the taste of spiders to hazelnuts.

Table 1 summarizes results of our review of the available material that mentions the use of spiders as food and for other purposes. In a number of Melanesian cultures, spiders (mostly unidentified) are roasted in embers and eaten as snack foods (see Kapauku, Yopno, Pawaia, Maring, Kilimeri, New Caledonia in Table 1). The apparent prominence of spider use among peoples of Oceania relative to those of other regions may merely be an artifact of small sample size. The Khmer of Cambodia are reported to eat large tarantulas (Theraphosidae) deep-fried in oil and served on skewers. They are reputed to enhance virility (Menzel and D'Aluisio 1998). Similarly, the Yanomamo of Venezuela extract *Theraphosa leblondi* (Theraphosidae) tarantulas from their burrows to eat, roasting them on the fire (Menzel and D'Aluisio 1998). This species is the world's largest spider and contributes a substantial amount of meat to a meal. The reports in Table 1 attributed to Bodenheimer should be treated with some caution, as none of the sources he cites are by recent credible ethnographers. A more exhaustive search might yield further examples from other cultures, and in particular we would expect more cases from foraging peoples, particularly of tropical and subtropical America, Africa and Asia.

Spiders and their webs are also used for purposes other than food. Again, there is very little of substance in the literature beyond passing references. The Nuaulu of central Seram, who are culturally related to the Alune, use the compacted web masses of *Nephila* species (Araneidae) as bait in line-fishing for needlefish, a practice Ellen (1993b:203) considers they must have learnt from other people, as, like the Alune, the Nuaulu are traditionally an interior people. Speiser (1996 [1923]:241) reports the use of compacted web mass of unidentified spiders to construct purses and ritual masks in Malekula, Vanuatu. The Ngarinman of northwest Australia used spiders' web to fashion small purses (Healey, unpub. fieldnotes).

Spiders are reported to be used for medicinal purposes in a number of areas. Hunn (1977:310–312) notes that among the Tzeltal of Chiapas, Mexico, tarantulas (Mygalomorphae) are used in a cure for tumors, with the spiders induced to bite the affected area. Bodenheimer also reports the medicinal or magical use of spiders. De Walckenaer notes that "in Brazil certain [unidentified] spiders are believed to be strong aphrodisiacs . . . , and the same quality is ascribed to them in folk medicine throughout the world" (Bodenheimer 1951:68). In the Kamchatka

TABLE 1.— Sources on use of spiders.

Ethnolinguistic group/location	Source	Uses
Australasia/Pacific		
Anindilyakwa (N Australia) Amiyanggal, Larrakia, Malak Malak, Wadjigyn, Werat, Wulna (N Australia)	Waddy (1988) Basedow (1907), Foelsche (1881-2), Healey (unpubl. field notes), Mackillop (1892-93), Spencer (1914)	Clan totems Web of ? <i>Nephila</i> used as ligature to sever finger joint of young females, in at least some cases in accordance with mythical prescription
Ngarinman (NW Australia)	Healey (unpubl. field notes)	Web of unidentified species used to make purse
Kapauku (western New Guinea) Yopno (Morobe Province, Papua New Guinea)	Pospisil (1963) Kocher Schmid (pers. comm.)	No details Unidentified species roasted and eaten by children
Pawaia (Eastern Highlands, Papua New Guinea)	Kocher Schmid (pers. comm.)	Unidentified species roasted and eaten by children
Maring (Western Highlands, Papua New Guinea)	Healey (unpub. field notes)	Various unidentified species, including ? <i>Nephila</i> sp. roasted and eaten, mostly by children
Kilimeri (West Sepik, Papua New Guinea)	Kocher Schmid (pers. comm.)	Funnel-web spiders (?) roasted and eaten by women
Malekula (Vanuatu) New Caledonia	Speiser (1996) Bergier (1941)	Web used to construct ritual masks <i>Araneus edulis</i> eaten grilled on coals
Asia		
Thailand Khmer (Cambodia) Nuauulu (Seram, Indonesia) Kamchatka (E Russia)	Bodenheimer (1951) Menzel & D'Aluisio (1998) Ellen (1993) Bodenheimer (1951)	Egg bags of spiders eaten Tarantulas (Theraphosidae) eaten deep fried Web of <i>Nephila</i> used as fishing lure Unident. species eaten by women to enhance fertility, ease labor
Africa		
San (South Africa) Maniana (Gambia) Merina (Madagascar) Cameroon (W Africa)	Bodenheimer (1951) Bodenheimer (1951) Bergier (1941) Zeitlyn (1993)	Eaten. No details Eaten. No details <i>Nephila madagascariensis</i> eaten fried in oil or fat Unident. species provide divination in legal cases
Azande (Central Africa)	Evans-Pritchard (1937)	Unident. species manipulated in curing rites

TABLE 1.—Continued.

Ethnolinguistic group/location	Source	Uses
Americas		
Tzeltal (Chiapas, Mexico)	Hunn (1977)	Tarantulas (Mygalomorphae) used in cure for tumors
Guaharibos, Piaroa (Paraguay)	Bodenheimer (1951)	Tarantulas eaten
Brazil	Bodenheimer (1951)	Unident. species eaten as aphrodisiacs
Yanomamo (Venezuela)	Menzel & D'Aluisio (1998)	<i>Theraphosa leblondi</i> (Theraphosidae) tarantulas eaten
Europe		
France, Germany	Bodenheimer (1951)	Unident. species eaten (personal idiosyncrasy?)
England	Black (1883)	Unident. species used to relieve fever
S Italy	Lewis (1991)	<i>Lycosa</i> sp. associated with Tarantula cult

Peninsula of eastern Russia eating unidentified spiders is said to confer fertility on sterile women, and ease labor (Bodenheimer 1951:68).

The seventeenth-century English antiquarian, astrologer, and solicitor, Elias Ashmole, provides us with evidence of another medicinal use of spiders in his diary for 11 April 1681: "I tooke early in the Morning, good dose of Elixir, & hung 3 Spiders about my Neck & they drove my Ague away, Deo gratias" (Ashmole 1966:1680).³ This was no Ashmolean idiosyncrasy; live spiders encased in a nutshell and worn about the neck were believed to relieve fever (Black 1883:59-60). One of Bodenheimer's possibly idiosyncratic German spider eaters spread them on bread in place of butter "as a purge" (Bodenheimer 1951:68).

Spiders may also serve positive symbolic uses. Among the Anindilyakwa of Groote Eylandt, northern Australia, spiders of any kind are among clan totems (Waddy 1988). Also in Australia, a number of related Aboriginal cultures of north-western Northern Territory (see Table 1) traditionally used the web of a large orb spider (*Nephila* species, Araneidae) to tightly bind the top joint of the first finger of young girls. This cut the circulation and in time the top joint dropped off (Basedow 1907:8; Foelsche 1881-2:7; Mackillop 1892-93; Spencer 1914:10). This practice follows a tradition associated with a large earthquake in the creation period (Lindsay et al. 2001). It was believed that by driving the stump of the severed finger into the ground women would be able to quell earth tremors (Healey, unpub. fieldnotes 2001).

Spiders were employed in divination and curing in various African cultures. Zeitlyn (1993) discusses the use of spiders as infallible agents of divination in courts administered by traditional rulers in several Cameroonian societies. Among the Azande of central Africa, a spider was sometimes produced by sleight of hand in curing rites by 'witch doctors' who claimed the spider contains the sick person's blood (Evans-Pritchard 1937:236).

Lewis (1991) reviews the *Tarantismo* spider cult of southern Italy, where women are typically believed to be recruited to the cult by seeking a ritual cure after supposedly being bitten by a tarantula spider. Tarantulas of the genus *Lycosa* are regarded as the actual counterpart of a dangerous spirit which inflicts harm on humans.

These fragmentary accounts of the mystical and medicinal aspects of spider use suggest an association of spiders with dangerous states. These include rectifying reproductive dysfunction in individuals by enhancing libido, conferring virility, and overcoming infertility; divining causes of social misfortune; and guarding against a repeat of mythical cataclysm. Even some of the reports of arachnophagy indicate that they are perceived primarily as medicines rather than as foods. It is tempting to speculate that this association of spiders with mystical dangers and bodily dysfunction may stem from a widespread cultural ambivalence towards spiders, perhaps stemming from the combination of the perceived delicacy of their webs and bodies and the remarkable strength of webs and the poisonous bite of at least some species.

What our review does indicate is that not only is the number of reported cases of use of spiders low, but the level of available detail is also generally limited. Our own material on the Alune is also limited in detail. It is offered here as a

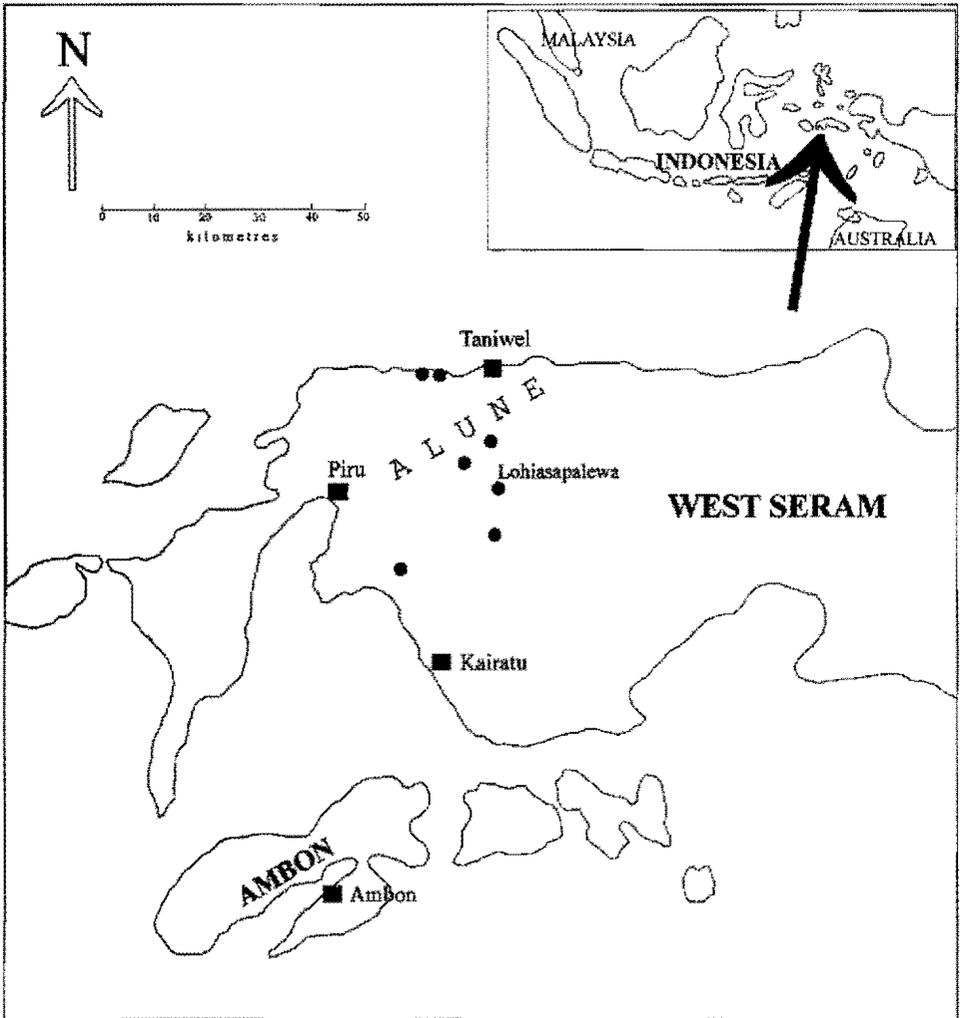


FIGURE 1.—Indonesia and West Seram. Alune villages are indicated by circles (not all shown), towns by squares.

preliminary contribution to a neglected area of human interaction with the biological environment.

THE ALUNE

The Alune are an Austronesian-speaking people living in twenty-five villages in north west Seram. Seram is one of the larger islands of central Maluku (the Moluccas or 'Spice Islands'), roughly midway between New Guinea and Sulawesi (Celebes) in eastern Indonesia (see Figure 1). The ancestral Alune domain is in the mountains of the interior of west Seram. The natural vegetation of this region is lowland and mid-montane rainforest. Large tracts of the rugged interior became depopulated when many Alune villages relocated to the narrow coastal belt

in northwest and southwest Seram, as detailed below. As a consequence, much of the natural vegetation remains in the rugged interior, with earlier settlement and gardening sites reverting to heavy forest.

The Alune were traditionally one of a number of indigenous tribal populations of Seram living in autonomous village communities that maintained separate domains. The local community is composed of several localized intermarrying descent groups. Principal sources on traditional Alune social organization and religion include Ekris (1867), Jensen (1948), Jensen and Niggemeyer (1939), Sachse (1907), Stresemann (1923), and Tauern (1918). Alune social organization, ecology and subsistence are similar to that of the Nuaulu as described by Ellen (e.g., 1978; 1988).

Alune subsistence was based on a combination of shifting cultivation of hill rice (*Oryza sativa*) and other food crops, processing of sago starch (*Metroxylon* sp.) from scattered family- and lineage-owned stands within the rainforest, and extensive gathering and hunting (Wolff and Florey 1998). Consistent with the seasonal and geographic distribution of these activities, the typical settlement pattern was one of a loose cluster of hamlets and widely dispersed family garden houses and more temporary encampments in the forest at sago groves and hunting and gathering grounds. Often groves and foraging grounds coincided, allowing for a diversity of activities based at a camp site; in other parts of the domain they were more widely scattered.

Traditional Alune religion focused on the placation of ancestral and local nature spirits, whose goodwill was regarded as necessary for ensuring the health and vitality of the living, and the productivity of the environment. Virtually all Alune in inland villages are now adherents of the Protestant Church of Maluku. The church is a significant source of pressure for cultural change, with its official expectation that traditional beliefs and practices will be abandoned by its adherents. It also broadly subscribes to the ideology of 'development' espoused by the Indonesian government, which regards 'traditional culture', often glossed by the Indonesian term *adat*, as essentially 'backward' and an impediment to progress. In practice, however, traditional beliefs nonetheless remain strong in many Alune villages, albeit seldom openly articulated in the presence of church or government officials and other outsiders. There is still a strong belief in the presence of ancestral spirits which will punish failure of the living to abide by the customary norms of moral behavior, and belief in the efficacy of certain magical formulae and practices (Florey and Wolff 1998). All members of the local community are expected to share the same cosmological beliefs and ritual practices, and failure to do so is considered to invite ancestral anger and retribution. Paradoxically, the strength of commitment to the Protestant Church of Maluku is itself a product of a continuing principle of *adat*, which has seen those who have chosen to follow dissenting Christian churches excluded from the community (Florey and Healey 2002). In that sense, wholesale conversion of villages to the same variant of religious observance masks a continuation of *adat* belief and practice, which is suppressed in its outward expression, while at the same time re-affirmed as fundamental to the maintenance of social order.

The influence of the Dutch colonial government was for the most part confined to the suppression of hostilities and fostering conversion to Christianity.

From the early twentieth century a policy of encouraging resettlement of villages along the narrow coastal plain of north and south Seram served these interests well. However, a number of Alune villages resisted such moves, retaining occupation of their ancestral domains in the rugged interior. One such village was that of Lohiasapalewa, the site of fieldwork on which this paper is based.

The pace of change increased following Indonesian independence in 1945 and more effective state control over Alune domains. In response to pressures from the state, Alune settlement patterns have been modified with the establishment of nucleated villages and more relocations to the coastal belt.

Of particular relevance for the focus of this paper, post-colonial authority has influenced changes in the patterns of Alune subsistence practices and other interactions with the environment. But it has also periodically resulted in temporary reassertion of more traditional pursuits. Official encouragement of consolidation of residence in villages, combined with the demands of the church for regular participation in religious practice centered on the village church, have concentrated subsistence activities within easy reach of the village. Recent decades have seen an increase in small-scale production of tree cash-crops such as cloves (*Syzygium aromaticum*), cacao (*Theobroma cacao*), and coffee (*Coffea canephora*) planted in small scattered groves in old garden sites mostly close to the village.

As a consequence of political, religious and economic changes, extended residence in distant garden shelters or forest camps is less common than in the past, and gardens are more likely to be sited closer to the village. Although hill rice is still a preferred crop, cassava (*Manihot esculenta*) has increasingly supplanted it in the everyday diet. Furthermore, hunting and gathering in the forest, especially the more distant parts of village domains, is less common now than in the past.

Nonetheless, at least twice over the last fifty years, the Alune of Lohiasapalewa have fled the village to take refuge in the forest. In the 1950s and 1960s, many villagers sought refuge in the forest to evade the conflicts between the Indonesian military and guerrillas of the ill-fated separatist Republic of the South Moluccas, or RMS (*Republik Maluku Selatan*). Then again in 1970, Lohiasapalewa villagers fled to the forest to evade intense pressure from the local administrative officer to relocate the village to the coast.

There are unconfirmed reports that villagers have again taken refuge in the forest in early 1999, since the outbreak of sectarian violence between Muslims and Christians in Ambon city, which rapidly spread to many other parts of Maluku. Sporadic violence continues to the present (August 2002), and has included attacks on Alune villages in the coastal plains and raised more general fears of escalation of violence.

The significance for this paper of these retreats into the forest is that recent historical circumstances forced Lohiasapalewa villagers to revert to a subsistence economy centered on hunting and foraging in the forest. The present unrest further underscores the potential importance of the forest as a safe haven and source of subsistence foods. Thus, a close dependence on wild resources, including insects and spiders, is part of the shared experience of virtually all Alune today, and goes at least part of the way to explaining the retention of a considerable body of detailed ethnobiological knowledge. Changes in subsistence patterns are

dealt with in more detail by Florey, Healey and Wolff with Manakane (in prep.) and Wolff and Florey (1998).

METHODOLOGY

The data on which this paper is based were collected over the course of several field trips to the inland Alune village of Lohiasapalewa in 1993–95. This research was part of a larger project on Alune ethnobiology and language change, involving collaboration between Florey, Healey, botanical consultant Dr. Xenia Wolff, and Alune subsistence farmer and expert on local natural history Mr Wempi Manakane. The research team drew upon the substantial linguistic and ethnographic knowledge of Alune gained by Florey over several fieldwork seasons in various Alune villages totaling over 24 months since 1988.

Alune knowledge of spiders was recorded in a number of different contexts. These included the following: focused discussion sessions on local fauna with individuals and small parties, mostly men, but sometimes also children and women; observations of spiders during excursions into different habitats in and around the village attended by Manakane and other Alune advisors and informants; examination and discussion of specimens of spiders and other invertebrates collected by Manakane and brought to Healey in evening work sessions, in which other adults of both sexes usually participated; chance observations of Alune behavior towards or talk concerning spiders.

No collections of specimens were made. However, we are building a photographic record of specimens. Most of the scientific identifications noted below were provided by Dr. Graham Brown of the Museums and Art Galleries of the Northern Territory, Darwin, Australia, based on photographs, as acknowledged in the text. Other identifications are our own tentative suggestions and should be treated with caution.

Ethnobiological knowledge is not evenly distributed within Alune communities, but varies with age, gender and personal interest. Despite his comparative youth, Mr Wempi Manakane, who was aged 25 years in 1995, is widely acknowledged by residents of Lohiasapalewa as a local expert in a broad range of traditional knowledge, including ethnobiological domains. The richness of the ethnobiological knowledge that he was able to convey to us, compared to that of many other villagers, certainly supports this reputation. He is also a highly articulate exegete of local knowledge, fluent and literate in Indonesian and the Ambonese Malay lingua franca. He has also adopted Florey's orthography for Alune and became fully literate in his own hitherto unwritten language. On a number of occasions, other Alune deferred to Manakane's opinion on various aspects of ethnobiological lore, or referred us to him as an appropriate person to consult. These referrals were not merely acknowledgement of the close working relations that developed between Manakane and us, as villagers also freely referred us to other recognized experts on diverse aspects of Alune culture and ecology.

Alune freely admit when they do not know the answer to questions, as indicated by their willingness to refer to other experts. Manakane himself is clearly conscious of the limits of his own ethnobiological knowledge, and referred us to others, or himself made enquiries of older people who are recognized as more

knowledgeable in various areas of indigenous knowledge. He made these referrals both in our presence when other experts were also present, and independently by seeking out advisors when he had been unable to provide us with information we sought.

We made no systematic tests for consistency of identification of specimens or other details of ethnobiological information between informants. Indeed, we argue against the methodological value of rigorous testing of consistency of information or responses to elicitation stimuli as being contrary to naturalistic discourse. Consistent with the general methodological orientation outlined above, our focus has been on eliciting Alune identifications and knowledge of organisms in the meaningful contexts within which they are encountered in the course of everyday life. One context of encounter with organisms in the environment is not the same as another. Wherever possible, we allowed our Alune hosts, advisors, and informants to determine the contexts in which we encountered and recorded their ethnobiological knowledge, rather than seeking to impose an alien framework of our own. It was, for example, Manakane's idea to collect specimens of invertebrates and bring them to Healey in the evening as an aid to discussions.

Because we sought information contingently in contexts meaningful to Alune we have undoubtedly not encountered all possible contexts, and our compendium of information is therefore probably incomplete. However, we argue that the resulting record more closely represents the Alune world view than more formal elicitation techniques.

ALUNE ETHNOBIOLOGY OF SPIDERS

The Alune regard spiders as just another element of the diverse fauna of their region. Alune knowledge and exploitation of insects are extensive (Florey et al., in prep.). Spiders are classified separately from insects, but they are treated in very similar ways, and attract much the same character of attention.

Alune regard most spiders as eminently edible. Like other small invertebrates they are usually lightly roasted beside the fire. With an increasing orientation of the local economy to subsistence horticulture and cash cropping, and a residential focus on the village, rather than a more forest-oriented economy of foraging, hunting and cultivation, spiders no longer appear to be commonly eaten or otherwise exploited, even by children. Certainly, this was the view of several of our informants, but we cannot be sure that the various opportunistic snacks we observed being consumed around hearths did not contain the odd spider.

We have no data on the nutritional contribution of spiders and other invertebrates to the Alune diet. The only available study of Alune diet (Novotny et al. 1996) focused on adult women, and is compromised by apparently recording only household meals, and neglecting the possible nutritional significance of between-meal snacking. Our observations indicate that Alune consume sometimes considerable amounts of food as snacks away from the main residence. Snacks range from wild and cultivated fruits, nuts and vegetables to invertebrates and small vertebrates cooked in garden houses or at impromptu small fireplaces, especially by small bands of children.

The views of informants indicate that spiders were more commonly exploited

in the past, but we have no evidence that this was other than on an opportunistic basis. It is therefore likely that spiders have only ever been a very minor component of the diet, and the nature of other human-spider interactions limited.

Nonetheless, in part because of the recent history of refuge in the forest, and the continuing interest in forest resources, many Alune preserve considerable knowledge of older patterns of exploitation of spiders and other invertebrates. Spiders form part of a wider pattern of close and intense interactions the Alune maintain with the natural environment. Exploitation of arthropods continues a long standing form of interaction with the environment in respect of that part of the diet that is based on a foraging component of the economy. Although recent social change has led to an increasing prominence of cassava and sago as the core component of main daily meals, there is a persistence of longer-established patterns of the foraging sector of the economy that yields considerable variety to the diet through frequent snacking, as an element of what we call a 'small food tradition'. This pattern of impromptu snacking, and the foraging behavior by which it is sustained, maintains a strong meaningful and subjective association with the forest as a core element of Alune perceptions of their ethnic identity as 'forest people'. This identity has been reinforced by their recurrent retreat into and dependence on the forest in periods of social upheaval. We do not mean to suggest that exploitation of spiders is itself definitive of Alune identity, but certainly this activity and the knowledge on which it is based are an integral part of a specifically Alune style of interaction with the environment at a subjective level.

The Arachnid fauna of Seram is poorly known. The abundance and species diversity of arthropods are high in central Seram (Stork and Brendell 1993). There are no good faunal surveys of the arachnid fauna of Seram that might be a guide to the number and identity of species that could be expected from the Lobiasa-palewa area.

Ellen (1993b) records ten terminal categories applied to spiders by the Nuauulu, another Austronesian-speaking people of south-central Seram. These are assigned to seven biological species, although the actual number is likely to be considerably greater. This compares well with our own data for the Alune; we have recorded a total of eight terminal categories applied to spiders, each tentatively ascribed to separate biological species. This suggests that there may be few, if any, Alune categories that we have not yet discovered.

Alune class all spiders in a single category termed '*wala'wa*'.² The term is applied to a set of categories which are all regarded as morphologically similar. Possession of eight legs is a key characteristic. '*wala'wa*' thus designates a well-defined natural category of organisms not further included in a higher order taxon. Despite the small number of terminal taxa making up the category, we consider '*wala'wa*' can reasonably be designated as a 'life form', equivalent to other Alune life forms, such as *manue*, 'birds'.

The label '*wala'wa*' is cognate with the Nuauulu term *wala-wala* recorded by Ellen (1993b:201). Interestingly, however, the Nuauulu term is applied to spiders' webs and to certain web-spinning spiders, rather than to spiders in general. In Alune spiders' webs are designated by the noun classifier for fibrous matter, *bueti*. Spiders' web is termed '*wala'wa esi bueti*' ('spider its fibrous mass'). We have no record of any uses of spiders' webs. The Nuauulu equivalent of the Alune '*wala'wa*'

is *kahunekete*, which contains ten named terminal categories (Ellen 1993b:200–204).

Nuauulu consider scorpions (Scorpionida) and harvestmen (Opiliones) to be closely related to spiders, and some of Ellen's informants suggested that harvestmen may be a kind of spider (Ellen 1993b:203). Alune opinion is much the same; at least some of our informants regard harvestmen somewhat ambiguously as possibly spiders, and certainly similar to spiders. While they are generally not included in the category '*wala'wa*', they are discussed here because of their perceived close similarity.

Scorpions are more clearly classified in a separate category, as they are among the Nuauulu (Ellen 1993b:203). Alune liken them to freshwater crabs, as indicated by the term '*li'we ta'umui*' (*li'we* is the general term for freshwater crabs, *ta'umui* means 'likeness' or 'resemblance', but also 'spirit of the dead/ghost'). Crabs are relished as food, but scorpions are not eaten.³ The ambiguous meaning of the term for scorpions ('resembling a crab' and 'ghost crab') is perhaps appropriate for these venomous creatures.

Alune regard the named categories outlined below to be morphologically distinct. Taxa are thus distinguishable by perceptual criteria, although there are also behavioral and ecological characteristics which informants highlight. The eight terminal categories applied to spiders and one applied to harvestmen appeared to be used with some discrimination, having been offered as identifications of specimens which were also morphologically distinctive to us. However, as already noted, we are unable to assess the consistency with which these category names are applied in instances of identification of specimens. The number of biological species present is undoubtedly well in excess of the forms we have observed and the Alune terms may have fairly wide application. Ellen (1993b:203) has noted that Nuauulu categories appear to be "wide-ranging and overlapping." While our own data on identification and classification are insufficient to corroborate this conclusion in respect of spiders, our data on other biological domains indicate that Alune identifications of naturally-occurring specimens and classifying behavior is similar to that reported by Ellen (1993a, 1993b) for the Nuauulu.

Several spiders, such as *Nephila* sp(p), are said by Alune informants to have a venomous or painful bite. However, while Alune handle dangerous spiders carefully they do so with confidence, and without apparent anxiety or squeamishness.

In what follows we briefly outline Alune knowledge of spiders and harvestmen by named terminal category within the higher order category of '*wala'wa*'. We also indicate uses and other cultural significance of spiders and harvestmen.

'wala'wa. The term applied to spiders collectively is also used as a label for a constituent terminal category. According to informants, the terminal category '*wala'wa*' is applied to spiders described as of medium size, and which shelter in curled leaves suspended within their webs which resemble a wheel. These serve as the focal category of spiders in general, and '*wala'wa*' as a terminal category probably is applied to a number of species of similar appearance and web-building. Focal '*wala'wa*' make a nest around a curled leaf in which the eggs are laid. These spiders are common in vegetation about homesteads and gardens, and are edible. We obtained no photographic record of specimens and the species remain

unidentified. We tentatively identify them as members of the leaf-curling spider group, family Araneidae.

'wala luma. This term means 'house spider', and is applied to huntsman spiders, Heteropodidae, found in houses. Several different species of Heteropodidae are represented in our photographic record, but unfortunately they have not been identified beyond family. Only one kind of these huntsmans (G. Brown, pers. com.) in the photographic record, a large grey spider encountered in houses, was identified as *'wala luma* (Figure 2). However, it is possible that identifications of *'wala luma* are based primarily on habitat, rather than morphological features, and this term may therefore apply to several similar species encountered in houses. Because *'wala luma* frequent houses and eat cockroaches and other objects of disgust they are considered inedible.

'wala metene. This term, meaning 'black spider', was applied to huntsman spiders found in fallow regrowth, a photograph of which has been ascribed to a second species of Heteropodidae. The large egg cases of this spider, lightly roasted by the fire, are regarded as delicious. These yield hundreds of tiny young when hatched.

'wala porole. This term was applied to another huntsman spider found in fallow regrowth. This has been identified as a third species of Heteropodidae (G. Brown, pers. com.). It is called *labalaba kuning* in Ambonese Malay. Both names mean 'yellow spider' and refer to the light brown color of this huntsman spider. This spider is edible.

'wala si'oli. This term is applied to the very large and common orb-weaving spiders, identified as *Nephila*, Araneidae (G. Brown, pers. com.) (Figure 3). The large females are highly distinctive and visible spiders, because of their size, glossy black and yellow bodies, and massive strong and sticky webs built across open spaces. Males are usually very small and seldom encountered with females except in the mating season (G. Brown, pers. com.), and it is not clear if Alune are aware of this extreme sexual dimorphism.

Alune provided no etymology of *si'oli*, but it can be translated loosely as 'it falls to the ground', from (*e*)*si* 'it' and *'oli* 'to slip and fall onto the ground (from a height)'. This is perhaps a reference to the spider's habit of constructing its webs high above the ground.

One can tell if other people have already passed by on a track as the webs will have been cleared away. This is the closest we have come to recording a functional use for spider web. Note that it is webs of the same genus that are used by the related Nuaulu as fishing lures.

While this spider is recognized to have a harmful bite, it is readily handled with care. It is considered edible, and spiders are roasted whole in the fire or steamed in bamboo tubes. *Nephila* species are also eaten in Madagascar and probably New Guinea (see Table 1).

'wala susu. This term was applied to distinctive hunting spiders encountered in undergrowth. We have no photographic record or identification of specimens, but they are possibly wolf spiders, Lycosidae. The translucent white color of these

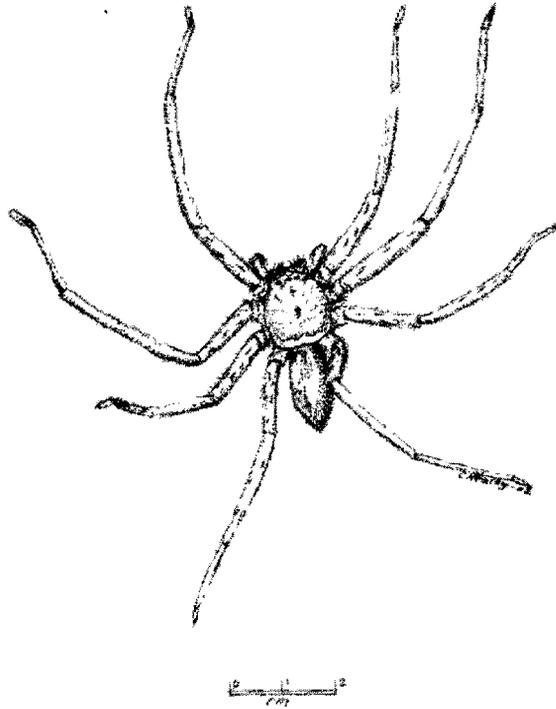


FIGURE 2.—*'wala'wa luma*, Heteropodidae. Huntsman spider. (Head and body length approx. 3 cm.; based on color transparency 94/4.23 20 June 1994 by C. Healey)

spiders is likened to breast milk, hence the specific name, *susu* meaning 'breast/milk'. *'wala susu* are edible.

'wala tasie. This term was applied to medium sized robust black spiders, probably *Araneus* species, Araneidae, found in leaf nests set in webs in scrubland. The spider is characterized by a hairy body and a painful bite. It is considered edible and has a rather pleasantly salty taste, hence its name: *tasie* meaning 'salty'. Members of the same genus are also eaten in New Caledonia (see Table 1).

'wala munine. This term was applied to medium sized dark wheel-web spinning spiders, possibly of the Family Arancidae (G. Brown, pers. com.). The spider is considered to be distinctive in having four clearly discernible eyes and in catching and eating other spiders and insects considerably larger than itself. It is likened to human sorcerers, *munine*, hence its name, because it kills others of its kind. Also, like human sorcerers, it can see behind itself. It is considered inedible, presumably because of its association with sorcery.

Idori. This term is applied to harvestmen (G. Brown, pers. com.), which constitute the Order Opiliones (also referred to by the older name Phalangida). These are small, round-bodied arachnids with eight immensely long, very thin legs. These resemble spiders in their general form, except that the two body parts of head-thorax and abdomen separated by a distinct 'waist' in spiders are fused into a single body part. Harvestmen also lack fangs, and unlike most spiders, they do

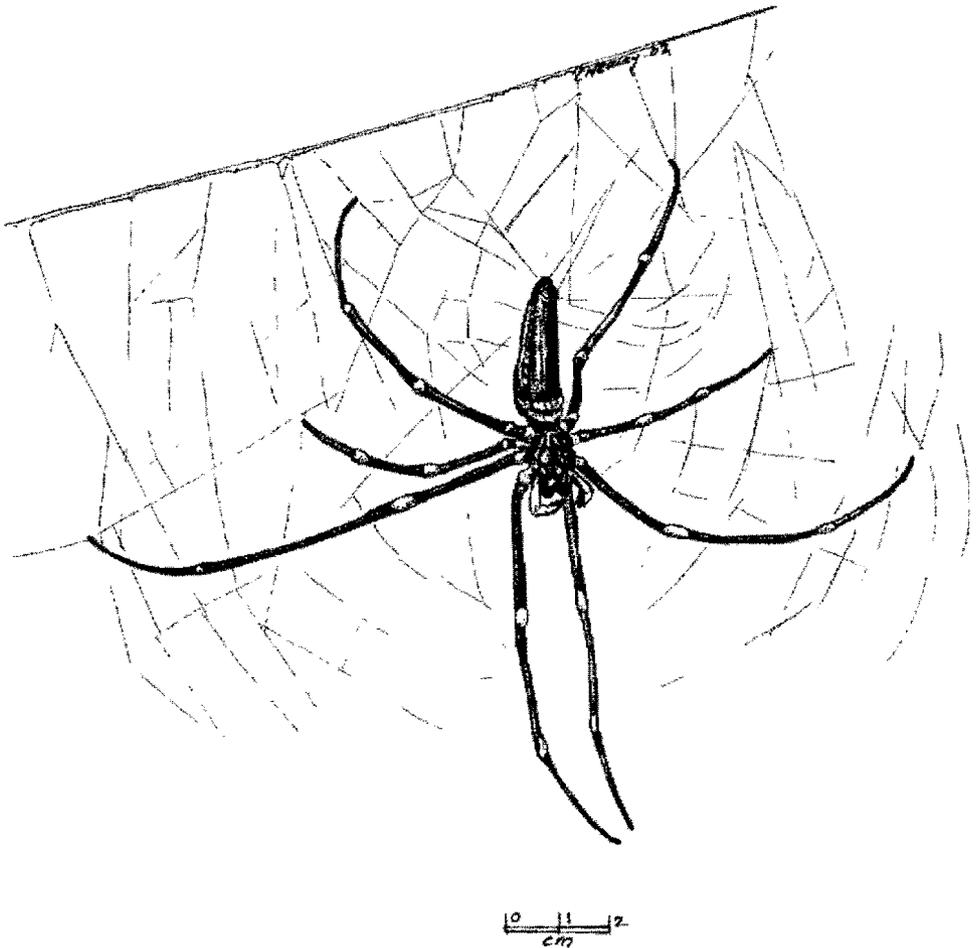


FIGURE 3.—'wala'wa si 'oli, *Nephila* sp. Orb-spinning spider (Head and body length approx. 3.5 cm.; based on color transparency 94/1.6 18 June 1994 by C. Healey)

not make webs. In discussing several live specimens brought by Manakane to Healey one evening, informants expressed uncertainty as to whether harvestmen should be classified as 'wala'wa or in a category of their own. Manakane sought to resolve this issue by counting the number of legs, reasoning that if they possess eight legs they should be classed as 'wala'wa. The fragile specimens had all lost varying numbers of legs, and it was not possible to determine the normal complement. Manakane and others present therefore opted to cautiously ascribe *idori* to an unaffiliated category. This indicates a strong objectivist basis to classificatory behavior, at least in this instance.

Idori are found under leaves in undergrowth, always two or three or more together. They run quickly when disturbed. We were offered no etymology of *idori*, but it can be translated as 'it falls over on the ground', from *i* 'he/she', and *dori* 'to fall over on the ground'. Perhaps this is a reference to the somewhat clumsy, gangling movements of harvestmen, and their tendency to be found close

to the ground. A secondary meaning of *dori* is 'to live alone and unhappily', although this does not seem readily applicable to the sociable harvestmen. In the past harvestmen were used as a cure for bed-wetting at night in children who should have outgrown the behavior. A specimen was rubbed on the child's belly on being put to bed at night.⁴ No objective, symbolic or metaphysical explanation was offered as a basis for this use. *Idori* are not considered edible.

CONCLUSION

All names for terminal categories of spiders and harvestmen are polymorphic, with the exception of the focal category of leaf-curl spiders (*'wala'wa*). Three names refer to color or appearance (*'wala metene*, *'wala parole*, *'wala susu*), one to taste (*'wala tasie*), one to habitat (*'wala luma*). These names thus refer to objective criteria that distinguish categories. The last three names refer to aspects of behavior descriptively (*'wala si'oli*, *idori*) or metaphorically (*'wala munine*).

Six of the eight terminal taxa applied to spiders are regarded as edible. Ellen makes no mention of views of the edibility of spiders among the Nuaulu, although he records many other invertebrates as edible (1993a, 1993b). The other two categories are deemed to be inedible, because of their association with dirt or mystical danger. While the recorded number of Alune categories of spiders is very small, and probably applied widely to diverse biological species of spider, it is notable that the edibility of all spiders is unambiguously marked. Alune categories are designated as positively edible (even highly esteemed) or definitely inedible for clearly articulated reasons. Harvestmen are more neutrally inedible, but have a medicinal application.

Such marked definition of edibility is not a feature of all life forms in Alune ethnobiology. For example, while many insects are defined as edible, and others clearly proscribed, many more have neutral edibility, being neither considered worthy of eating nor specifically regarded as inedible. Similarly, as far as we are aware, all birds are considered edible but only a few are particularly esteemed as food. Even the smallest bird, which can be fairly easily killed with a lucky shot with bow and arrow or taken from the nest, yields more meat than a spider, but attracts less notice for its edibility.

Spiders are evidently an insignificant source of food, given their small size and the solitary habits of most species, which precludes collecting large quantities readily. Alune ascribe no remarkable edible qualities to spiders other than pleasant taste. Functionally, spiders on their own can never have assumed any significance in the Alune diet or adaptation to their rainforest habitat. Yet, taken in conjunction with a highly varied intake of other animal foods, from ant and spider eggs to deer and pigs, they form an integral part of the 'small food tradition' in a diversified subsistence economy of forest foraging, swidden cultivation, sago processing and hunting. The Alune example suggests the possible value of attention to spiders as dietary and medicinal items in the subsistence strategies of other indigenous cultures of similar economy.

NOTES

- ¹ We are grateful to Margaret Healey for this information on Ashmole's use of spiders.
- ² We adopt the orthographic convention of using an apostrophe to represent the glottal stop, which occurs in the Central Alune dialect spoken in Lohiasapalewa (Florey 2001).
- ³ Lest it be assumed that scorpions are intrinsically inedible, we note that Menzel and D'Ahuio (1998) report that in Guangzhou province, China, scorpions are raised in homes and specially constructed basement 'farms' as wholesale business. They are added to soups and used in medicines.
- ⁴ See Florey and Wolff (1998) for an overview of Alune ethnomedical concepts and practice.

ACKNOWLEDGMENTS

A version of this paper was presented in a poster session at the 22nd Annual Conference of the Society of Ethnobiology in Oaxaca, Mexico, 10–13 March 1999. We thank participants for their positive response to our paper and helpful comments. We also thank Dr. Christin Kocher Schmid of the Department of Anthropology, University of Kent at Canterbury, for information on use of spiders in Papua New Guinea which appears in Table 1. We also thank three anonymous referees for the *Journal of Ethnobiology*, editor Naomi F. Miller and former editor, Bill Balée, for helpful comments on earlier versions of this paper.

We acknowledge the Wenner-Gren Foundation for Anthropological Research for Grant 5683 in support of Florey's research titled "The Alune Language of Central Maluku" and an Australian Research Council Small Grant administered by Northern Territory University in support of a joint project by Healey and Florey in 1994–95.

We thank Dr. Graham Brown, Chief Entomologist of the Museums and Art Galleries of the Northern Territory, Darwin, Australia, for providing scientific identifications from photographs of specimens. Our greatest debt is to our Alune hosts, collaborators, advisors and informants. In particular, we wish to thank Wempi Manakane for his tireless assistance, advice, and information; Yusup and Leonorci Lumaupuy and Anderius and Blandina Kwalomine for their help and hospitality in Lohiasapalewa; and Herman and Fransina Marwa and the late Albert Nikijuluw and Emmy Nikijuluw of Ambon.

REFERENCES CITED

- Ashmole, Elias. 1966. *Elias Ashmole (1617–1692): His Autobiographical and Historical Notes, His Correspondence, and Other Contemporary Sources Relating to His Life and Work: Volume IV Texts 1673–1701*, ed. C.H. Josten. The Clarendon Press, Oxford.
- Basedow, Herbert. 1907. Anthropological notes on the western coastal tribes of the Northern Territory of South Australia. *Proceedings of the Royal Society of South Australia* 31:1–62.
- Bergier, Emile. 1941. *Peuples entomophages et insectes comestibles: étude sur les moeurs de l'homme et de l'insecte*. Imprimerie Rullière Frères, Avignon.
- Black, W.G. 1883. *Folk-medicine: A Chapter in the History of Culture*. Folk-lore Society, London.
- Bodenheimer, F.S. 1951. *Insects as Human Food: A Chapter of the Ecology of Man*. W. Junk, The Hague.
- Britton, E.B. 1984. A pointer to a new hallucinogen of insect origin. *Journal of Ethnopharmacology* 12:331–333.
- Dufour, Darna L. 1987. Insects as food: a

- case study from northwest Amazon. *American Anthropologist* 89:383-397.
- Ekris, A. van. 1867. Iets over het Ceramsche Kakiaverbond. *Tijdschrift voor Indische Taal-, Land- en Volkenkunde* 16:290-315.
- Ellen, Roy F. 1978. *Nuauulu Settlement and Ecology: An Approach to the Environmental Relations of an Eastern Indonesian Community*. Nijhoff, The Hague.
- . 1988. Foraging, starch extraction and the sedentary lifestyle in the lowland rainforest of central Seram. In *History, Evolution and Social Change in Hunting and Gathering Societies*, eds. J. Woodburn, T. Ingold, and D. Riches, pp.117-134. Berg, London.
- . 1993a. *The Cultural Relations of Classification: An Analysis of Nuauulu Animal Categories from Central Seram*. Cambridge University Press, Cambridge.
- . 1993b. *Nuauulu Ethnzoology: A Systematic Inventory*. Centre for Social Anthropology and Computing Monograph 6, University of Kent at Canterbury, Canterbury.
- Ernst, Thomas M. 1978. Aspects of meaning of exchanges and exchange items among the Onabasulu of the Great Papuan Plateau. *Mankind* 11:187-197.
- Evans-Pritchard, E.E. 1937. *Witchcraft, Oracles and Magic among the Azande*. The Clarendon Press, Oxford.
- Flood, Josephine. 1980. *The Moth Hunters: Aboriginal Prehistory of the Australian Alps*. Australian Institute of Aboriginal Studies, Canberra.
- Florey, Margaret. 2001. Verb and valence in Alune. In *Explorations in Valency in Austronesian Languages*, eds. Peter Austin, Barry Blake, and Margaret Florey, pp. 73-120. La Trobe Papers in Linguistics, Volume 11. Melbourne.
- Florey, Margaret and Christopher Healey. 2002. 'Work well and guard your honour': temporary labour migration and the role of adolescent women in eastern Indonesia. *Asian Studies Review* 26:355-381.
- Florey, Margaret, Christopher J. Healey, and Xenia Wolff, with Wempi Manakane. In preparation. *From the Edge of the Forest: Alune Ethnobiology in a Changing World*.
- Florey, Margaret J. and Xenia Wolff. 1998. Incantations and herbal medicines: Alune ethnomedical knowledge in a context of change. *Journal of Ethnobiology* 18: 39-67.
- Foelsche, Paul. 1881-2. Notes on the Aborigines of north Australia. *Proceedings of the Royal Society of South Australia* 5: 1-18.
- Gell, Alfred. 1975. *Metamorphosis of the Cassowaries: Umeda Society, Language and Ritual*. Athlone Press, London.
- Groark, Kevin P. 1996. Ritual and therapeutic use of 'hallucinogenic' harvester ants (*Pogonomyrmex*) in native south-central California. *Journal of Ethnobiology* 16:1-29.
- Healey, Christopher J. 1990. *Maring Hunters and Traders: Production and Exchange in the Papua New Guinea Highlands*. University of California Press, Berkeley.
- Hill, Kim and Kresten Hawkes. 1983. Neotropical hunting among the Aché of eastern Paraguay. In *Adaptive Responses of Native Amazonians*, eds. Raymond B. Hames and William T. Vickers, pp. 139-188. New York: Academic Press.
- Hunn, Eugene S. 1977. *Tzeltal Folk Zoology: The Classification of Discontinuities in Nature*. Academic Press, New York.
- . (with James Selam and family). 1990. *Nch'i-Wána "The Big River": Mid-Columbia Indians and Their Land*. University of Washington Press, Seattle.
- Jensen, Adolf E. 1948. *Die Drei Ströme: Züge aus dem geistigen und religiösen Leben der Wemale, einem primitiven Volk in dem Molukken*. J.W. Goethe-Universität, Frobenius-Institut, Leipzig.
- Jensen, Adolf E. and H. Niggemeyer. 1939. *Hainuwele: Volkserzählungen von der Molukken-Insel Ceram*. J.W. Goethe-Universität, Forschungsinstitut für Kulturmorphologie, Frankfurt.
- Levi-Strauss, Claude. 1973. *From Honey to Ashes*. Cape, London.
- Lewis, I.M. 1991. The spider and the pangolin. *Man* 26:513-525.
- Lindsay, Bidy Yinggony, Kitty Waliwararra, Frances Miljat, Helen Kuwarda, Rita Pirak, Albert Muyung, Edwin Pambany, Jack Marruridj, Patricia Marrfurra, and Glenn Wightman. 2001. *Malakmalak and Matngala Plants and Animals: Aboriginal Flora and Fauna Knowledge from the Daly River Area, Northern Australia*. Northern Territory Botanical Bulletin No. 26, Parks and Wildlife

- Commission of the Northern Territory, Darwin.
- Mackillop, Donald. 1892-93. Anthropological notes on the Aboriginal tribes of the Daly River, north Australia. *Royal Society of South Australia Transactions and Proceedings* 17:254-264.
- Menzel, Peter and Faith D'Aluisio. 1998. *Man Eating Bugs: The Art and Science of Eating Insects*. Ten Speed Press, Berkeley.
- Meyer-Rochow, V. Benno. 1976. The use of insects as human food. *Food and Nutrition* 33:151-152.
- . 1978/79. The diverse uses of insects in traditional societies. *Ethnomedizin* 5:287-300.
- Novotny, Rachel, Fook Ling Ng, Fred Rumlalatu, and Pick Yee Tang. 1996. Nutritional status of women in a sago-based foraging environment in eastern Indonesia. *Cakalele, Maluku Research Journal* 7:9-16.
- Posey, Darrell A. 1981. Wasps, warriors and fearless men: ethnoentomology of the Kayapó Indians of central Brazil. *Journal of Ethnobiology* 1:165-174.
- . 1983. Keeping of stingless bees by the Kayapó Indians of Brazil. *Journal of Ethnobiology* 3:63-73.
- . 1986. Topics and issues in ethnoentomology with some suggestions for the development of hypothesis-generation and testing in ethnobiology. *Journal of Ethnobiology* 6:99-120.
- Pospisil, Leopold. 1963. *Kapauku Papuan Economy*. Yale University Publications in Anthropology, no. 67, New Haven.
- Ruddle, K. 1973. The human use of insects: examples from the Yukpa. *Biotropica* 5: 94-101.
- Ruddle, K., D. Johnson, P.K. Townsend, and J.D. Rees. 1978. *Palm Sago: A Tropical Starch from Marginal Lands*. Canberra: Australian National University Press.
- Sachse, F.J.P. 1907. *Hei eiland Seran en zijne bewoners*. Brill, Leiden.
- Sahlins, Marshall. 1972. *Stone Age Economics*. Athlone, London.
- Setz, Eleonore Zuluana Freire. 1991. Animals in the Nambiquara diet: methods of collection and processing. *Journal of Ethnobiology* 11:1-22.
- Silberbauer, George B. 1981. *Hunter and Habitat in the Central Kalahari Desert*. Cambridge University Press, Cambridge.
- Speiser, Felix. 1996. *Ethnology of Vanuatu: An Early Twentieth Century Study*. (Translated by D.Q. Stephenson). Crawford House Publishing, Bathurst. Originally published 1923 as *Ethnographische materialien aus den Neuen Hebriden und den Banks-Inseln*. C.W. Kreidel's Verlag, Berlin.
- Spencer, Baldwin. 1914. *Native Tribes of the Northern Territory of Australia*. McMillan, London.
- Stork, Nigel E. and Martin J.D. Brendell. 1993. Arthropod abundance in lowland rain forest of Seram. In *Natural History of Seram, Maluku, Indonesia*, eds. I.D. Edwards, A.A. Macdonald and J. Proctor, pp. 115-130. Raleigh International, Andover.
- Stresemann, E. 1923. Religiöse Gebräuche auf Seran. *Tijdschrift voor Indische Taal-, Land- en Volkenkunde* 62:305-424.
- Tauern, Odo D. 1918. *Patasian und Patalima; vom Molukkeneiland Seran und seinen Bewohnern*. Voigtländer, Leipzig.
- Taylor, Paul Michael. 1990. *The Folk Biology of the Tobelo People: A Study in Folk Classification*. Smithsonian Institution Press, Washington, D.C.
- Waddy, J.A. 1988. *Classification of Plants and Animals from a Groote Eylandt Aboriginal Point of View* (2 vols.) Australian National University North Australia Research Unit Monograph, Darwin.
- Wolff, Xenia and Margaret J. Florey. 1998. Foraging, agricultural, and culinary practices among the Alune of west Seram, with implications for the changing significance of cultivated plants as foodstuffs. In *Old World Places, New World Problems: Exploring Resource Management Issues in Eastern Indonesia*, eds. S. Pannell and F. von Benda Beckman, pp. 267-321. Centre for Resource and Environmental Studies, ANU, Canberra.
- Zeitlyn, David. 1993. Spiders in and out of court, or, 'The long legs of the law': styles of spider divination in their sociological contexts. *Africa* 63:219-240.