J. Ethnobiol. 15(1):71–87 Summer 1995

BIOLOGICAL DIVERSITY AND COMMUNITY LORE IN NORTHEASTERN THAILAND

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ABSTRACT.—As communities experience economic development the value of traditional resources is typically reassessed. How much people currently know about particular indigenous food plants, and the attitudes they express about them, are seen a means to predict whether or not the plants will remain a part of the local diet and if they will persist as cultivated, tended, or wild species in a landscape transformed by modernization. To address this subject, populations in four villages, and two educational institutions in the Northeastern region of Thailand, were asked to identify certain food plants from photographs and supply some information about each species. High school students scored significantly better than university students. People comparable in age to the students, but not receiving formal education, did best. People from farms and villages consistently knew more than urban dwellers, and those from the most remote and undeveloped provinces scored highest. Ownership of transport vehicles and travel experience were inversely related to performance in the knowledge test. The results suggest that as more opportunities become available for education, and as migration to urban centers continues, knowledge and use of traditional food plants will decrease. More recognition of these as resources is needed in the formal education system.

RESUMEN.—Conforme las comunidades se desarrollan economicamente, se reevalúa por lo general el valor de los recursos tradicionales. La medida en que la gente conoce actualmente particulares plantas alimenticias indígenas, y las actitudes que expresan acerca de ellas, son vistas como una forma de predecir si las plantas seguirán siendo parte de la dieta local, y si persistirán como especies cultivadas, protegidas o silvestres en un paisaje transformado por la modernización. Para abordar esta cuestión, se pidió a la población de cuatro pueblos y dos instituciones educativas de la región nordeste de Tailandia que identificaran ciertas plantas alimenticias en fotografía y que proporcionaran alguna información sobre cada especie. Los estudiantes a nivel medio lograron puntuaciones significativamente mejores que los estudiantes universitarios, si bien personas de edad comparable que no habían recibido educación formal obtuvieron los mejores resultados. Las personas del campo y las aldeas sabían consistentemente más que los habitantes urbanos, y aquéllas que venían de las provincias más remotas y subdesarrolladas lograron las puntuaciones más altas. La posesión de vehículos de transporte y la experiencia de viaje estuvieron inversamente relacionados con los resultados del examen de conocimiento. Los resultados sugieren que, a medida

que se abren más oportunidades para educación y continúa la migración a los centros urbanos, el conocimiento y uso de las plantas alimenticias tradicionales disminuye. En el sistema de educación formal se requiere major reconocimiento de estas plantas como recursos.

RÉSUMÉ.—Alors que les communautés connaissent un développement économique, la valeur des ressources traditionnelles est typiquement réévalué. Les connaissances des plantes indigènes vivrière particulières et les attitudes envers ces plantes sont vues comme moyen de prédire si ces plantes feront ou non partie de l'alimentation locale et si elles continueront à être cultivées, entretenues ou resteront à l'état sauvage dans un environnement transformé par la modernité. Afin d'élaborer ce sujet, il e été demander à la population de quatre villages et à qux membres de deux institutions éducationnelles de la région du Nord-est de Thaïlande d'identifier, d'après des photographies, certaines plantes vivrières et de donner des informations sur chaque espèce. Les élèves de lycées ont nettement mieux réussi que les étudiants d'universités, encore que les personnes d'un âge similaire mais n'ayant reçu aucune éducation scolaire ont eu plus de succès. Fermiers et villageois en savaient constamment plus que les habitants des villes; de plus ceux des provinces les plus reculées et les moins développées se sont avérés les meilleurs. La possession d'un moyen de transport ainsi que l'expérience des voyages étaient inversement reliées aux résultats de l'épreuve de connaissance. Les résultats suggèrent qu'avec davantage d'opportunités d'études devenant accessibles et avec la migration vers les centres urbains continuant, la connaissance et l'utilisation des plantes vivrières traditionnelles diminueront. Il est nécessaire que dans le système d'études conventionnelles celles-ci soit plus reconnues comme ressources.

INTRODUCTION

What people know about the plants they eat or see growing around them reflects the relationship between themselves and their physical and cultural environment. Economic development in parts of Southeast Asia is making dramatic material improvement in the circumstances of large segments of the population. However, social and cultural traditions that were once characterized by great geographical variability, are being profoundly altered by new, typically urban, tastes and values. This is producing both cultural homogenization and a reduction in biological diversity as local varieties and even species are no longer tended or cultivated or their habitat is lost as a result of changes in land use. Villages beyond the end of the road, where former traditions may persist, are also often refugia for germplasm upon which modern commercial agricultural systems may ultimately depend (Soemarwoto et al. 1985). Thus the prosperity of the broader national or world economy will suffer unless genetic raw material is protected to allow development of new commercial crops, or advanced varieties of existing ones. Seed banks and botanical gardens have a crucial role to play in the preservation of taxa recognized by plant scientists, but there is more to biological diversity than this. The fullest range of genetic diversity can be perpetuated where cultural traditions and practices associated with these plants are maintained as well.

The objective of this research is to investigate the current levels of knowledge about traditional food plants in Northeast Thailand, where the population is experiencing rapid social and economic change, in order to help guide conservation planning.

Loss of traditional knowledge among agricultural communities in many parts of the developing world has been noted. In Northern Thailand Anderson (1993) has expressed concern about the perpetuation of such information among the Hill Tribes. Works (1990) has recorded that elders in a Peruvian community frequently lament that the young are no longer interested in plants or gardens. Maikhuri and Gangwar (1993) observed that among the Khasi and Garo tribes of Northeastern India, knowledge about plants by the young was judged to be poor. It is commonly believed that children learn to recognize species, and the skills for collecting and cultivating plants, as they assist their parents and grandparents with field work (Brierley 1985). When this does not occur an important unifying bond for the community is weakened and the biological heritage reduced as some plant taxa are no longer cultivated, collected, or even recognized as resources.

Ironically, communities that have moved further along the path of economic development discover that traditions relating to the growing and the consumption of traditional plant foods—valuable means of fostering cultural pride and ethnic identity—have diminished in the process of modernization. Unfortunately this may only occur after many negative aspects of economic transition have manifested themselves and many plant taxa have already been lost. In Hawai'i taro (*Colocasia esculenta* [L.] Schott) was the staple food for indigenous people, but the amount under cultivation has declined since the nineteenth century. However, at present among native Hawaiians there is a reawakening to the value of the plant both for its nutritional qualities and as a focus for ethnic pride. In the 1930s 342 names of taro varieties were recorded, but only 67 existing taxa could be found by the 1980s, suggesting that significant losses had already taken place (Abbott 1992).

In the face of degradation of traditional knowledge, one approach is to record and archive as much material and information as possible from a decreasing number of informants who still retain such knowledge. However, there is much that can not be recorded in written form, especially in a language and culture different from the one in which the culture evolved and developed (Sarukhán 1985). An alternative procedure is to focus on maintaining the integrity of the encompassing human-ecological system. Referred to as *in situ* conservation, some see this as a more effective way to protect genetic resources, since the aim is to conserve plant species within their established physical and cultural environmental setting. *In situ* conservation has the added advantage of also preserving those organisms whose value or ecological role is not yet appreciated by any culture (Altieri and Merrick 1987).

For such a contextual approach to biotic conservation and cultural continuity to be successful, the focus must be on the character and function of the community as a whole. It is important to understand how and when information is acquired and passed between members of the community. It is often not clear, for example, whether most information on a particular subject is shared by all mature adults or known only by particular individuals, who have a special role as con-

servers and depositories of knowledge (Padoch and de Jong 1991). Considering how perpetuation of this knowledge is affected by new external forces now shaping traditional societies, such as enhanced opportunity for formal education and geographical mobility, is of vital importance.

STUDY SITE

The foothills of the Himalayas in mainland Southeast Asia have long been recognized as an important center of diversity for cultivated plants (DeCandolle 1883; Vavilov 1926; Sauer 1952). Archaeological discoveries in Thailand have confirmed that its inhabitants were lively experimenters with indigenous plant resources by 10,000 BP (Gorman 1969; Glover 1977; Solheim 1970, 1972). The legacy of an ancient Southeast Asian agricultural system survives in many parts of rural Thailand. Upland swidden agriculture and traditional kitchen gardens contain a diverse assemblage of crops and animals raised together in a complex structurally and functionally similar to a natural ecosystem in which one component supports another (Fernandes and Nair 1986; Soemarwoto et al. 1985). On the basis of the large number of cultivated varieties found in this general area, Vavilov (1926) suggested it was a likely hearth of agriculture.

Today, within Thailand, the Northeast region is known for the many food plants that are cultivated, casually tended, or collected directly from the wild. Scholars often attribute the variety of organisms consumed as food to the economic poverty of a region where every possible source of sustenance must be utilized. Although urbanized Central Thais view some of the typical foods in the Northeast with some distaste, in fact the Northeast has contributed much to the richness and diversity of Thai cuisine (Van Esterick 1992; Wester and Chuensanguansat 1994).

Because old traditions remain generally strong in Northeastern Thailand, we selected this region as the main site for this research. The 16 provinces that make up the Northeast region, referred to as Isaan, extend over an area of slightly elevated sandstone known as the Korat Plateau (Fig. 1). This area has historically been more impoverished than other regions of the county, partly due to the generally poor quality of the sandstone-derived soil, and also because the area is ringed by mountains that extract moisture from rain-bearing monsoon airstreams. This makes the plateau more susceptible to drought than any other part of mainland Southeast Asia. Isaan has its own distinctive language and culture within Thailand akin to that of neighboring Laos (Rambo 1991). Rural people, particularly in the northern part of Isaan, identify themselves as "Lao." The Lao language is more commonly spoken in villages than standard Thai, which is learned in school. Historically, the area has been under the control of Khmer, Mon, Thai, and Lao kingdoms, but the majority of the population today is ethnically Lao.

The staple food of the region is glutinous rice. Protein in diets comes mainly from fish, insects, crustaceans, amphibians, reptiles, and mammals and is complemented by a wide variety of plants that serve as the main sources of vitamins and minerals (Somnasang et al. 1986). People collect a multitude of wild plants from the forests and often transplant useful species to more convenient locations,

FIG. 1—Location of study sites in Northeast Thailand.

such as home gardens (Moreno-Black 1991). Many plants are identified as either a domesticated (*baan*) or a wild or forest (*paa*) variety. Plants and seeds from gardens are traded actively, or given as gifts, within and between villages, and with contacts far afield. To a very limited extent, villagers sell these to provide a small cash income for a household (Yongvanit et al. 1990). Although most of the volume of plant materials offered for sale in markets is commercially produced, there are

TABLE 1.—Plant species richness in Thai markets.

		Total species
Northeast Region	Khon Kaen	106
	Sakon Nakhon 2	93
	Tha Bo 3	92
	Nong Khai	90
	Khon Kaen 2	85
	Loei, Night Market	82
	Nakhon Pathom	80
	Korat	78
	Sawang Daen Din	77
	Chiang Khan	76
	Loei, Day Market	74
	Sakon Nakhon	73
	Udon Thani	69
	Si Chiang Mai	69
	Tha Bo 4	69
	Tha Bo 1	65
	Tha Bo 2	65
	Kranuan	54
	Kham Perm	35
Other	Aw Dtaw Gaw, Bangkok	115
	Pak Khlong, Bangkok	107
	Aw Dtaw Gaw, Bangkok	101
	Bangkeng, Bangkok	98
	Aw Dtaw Gaw, Bangkok	91
	Khlong Thoey, Bangkok	89
	Kuala Lumpur, Malaysia	72
	Narathiwat, Southern Region	57
AVERAGE		80.0

typically several traders who specialize in the fruits, roots, flowers, and leaf vegetables which reflect the variety and character of the former subsistence agriculture.

METHODS

In the absence of other statistical information, observing the composition of merchandise offered for sale in a market is an indirect way of determining what kinds of food are available or preferred in an area (Ishige and Ruddle 1986). Accordingly, we surveyed fresh plant foods in 20 produce markets, mostly in the Northeastern region (Table 1). Some markets in Bangkok and elsewhere were included for comparison. We prepared a list of expected species for rapid recording of those identified by sight in markets. Rarer species were of special interest. We recorded local names and collected voucher specimens whenever possible for later identification. As plants were often represented only by juvenile leaves, which typically lack crucial diagnostic characters, a number of species have yet to be

TABLE 2.—Plant species used in identification test.

Botanical name (Family)	Common name	Percent correct indent	Frequency in markets
Marsilea crenata (Marsileaceae)	*phak waen*	75.2	7
Cratoxylum spp. (Guttiferae)	*phak tiu*	62.6	15
Barringtonia subangulata (Barringtoniaceae)	*kra don, chik*	61.7	3
Trapa incisa (Trapaceae)	*kra chap*	46.5	2
Caesalpinia mimosoides (Leguminosae)	*khayaa, chalueat*	40.6	8
Cissus hastata (Vitidaceae)	*hop hep, poun*	23.3	1
Hydrocharis morsus-ranae (Hydrocharitaceae)	*nong ma, pae, tao*	21.8	4
Garcinia spp. (Guttiferae)	*som mong*	19.8	3
Momordica charantia (Cucurbitaceae)[1]	*mara, phak hai*	19.2	1
Perilla frutescens (Labiatae)	*ngaa khee mon*	0.0	2

[1] This was not the common weedy plant whose leaves are found in most markets or the domesticated bitter melon cultivated for its fruits but a variety with sharply ribbed fruit possibly collected from the wild. The ripe fruit of this species is known to be toxic, but the leaves and immature fruits are eaten in India and the Far East apparently without ill effect (Purseglove 1968).

satisfactorily identified. Markets were surveyed during the wet season in the months of July and August as early in the morning as possible. We surveyed some markets more than once to assess variation from day to day and at various times of day.

To obtain an objective measure of the degree to which information about traditional subsistence food plants is being transferred to the younger generation, we conducted a total of 795 interviews among six populations. These populations were: university students at Khon Kaen University, high school students at a rural high school in Sawang Daen Din (a district center within Sakon Nakhon Province), and villagers in four rural settlements; Kok Khon and Na Bon (Nong Khai Province); Sai Thong (Kalasin Province); and Sawang Daen Din district (Sakon Nakhon Province) (Fig. 1). The last named population consisted of two subpopulations, one from the village of Nong Phai and the second from several villages nearby. In some cases we treated these subpopulations separately, as will be discussed below.

As a basis for an objective test of plant knowledge, a set of high quality color photographs of 10 selected plants was prepared. The photographs depicted leaves, young shoots, or fruits of food plants that we observed for sale in produce markets (Table 2). All plants used for the identification test are found in other parts of Thailand, where distinctive regional names are sometimes applied to them (Smitinand 1980). We did not include very common species, but selected a range of plants found moderately commonly to rarely in markets. Plants not believed to be part of the indigenous agricultural system were excluded, as were species produced by large scale commercial agriculture. The presence of diagnostic visual characters of species influenced the choice of plants for the test procedure. We selected two species very similar in appearance to test whether subjects could differentiate them from photographs.

Each subject was asked to identify each plant, and provide some information about it. The ability to supply a commonly used name for a plant was assumed to be a measure of a person's familiarity with it. We also asked subjects for some personal information, such as age, place of birth, educational level, and whether their home was rural (a village or farm) or urban (a town or city). In an effort to obtain some measure of mobility, and so determine experience beyond their homes, subjects were asked what transport vehicles their family owned (bicycle, motor bike, car, or truck) and whether they had ever visited the main cities of the Northeastern region (Nakhon Ratchasima or Korat) and the neighboring Northern region (Chiang Mai), the national capital (Bangkok), or a foreign country. Field assistants who were native Thai speakers conducted all interviews in that language. The high school students were asked to complete information in a classroom setting by a teacher as part of a course in environmental studies. Hired assistants conducted all other interviews individually. Assistants included students from Khon Kaen University already trained in interview techniques, and others trained specifically for this project. The university students surveyed were selected randomly on the university campus. In each of the villages surveyed, we mapped the location of all houses and selected a predetermined number of houses. In most cases only one person from each household was interviewed.

A list of plant names was compiled from the responses given at interviews and compared with published records (Smitinand 1980; Bunkerd et al. 1982; Vidal 1959). We asked four local authorities—two professional botanists at Khon Kaen University and two local informants with post-graduate degrees in biology or agriculture—to consider the full list of names given for each plant and to indicate which names were appropriately applied. These experts generally agreed on which names were correctly used for each plant. Other names supplied usually referred to other species. In a small number of cases, subjects used names that did not appear in any reference source or were unknown to the authorities we consulted.

RESULTS AND DISCUSSION

The market surveys yielded a total of 233 species, including 65 that were found in only one of the markets. Total numbers of species per market ranged from 115 to 35, with an average of 80 (Table 1). This compares to about 70 fresh produce species typically found in a large supermarket in the United States. The markets richest in species tended to be those in Bangkok that catered to foreigners or Thais with more cosmopolitan tastes and where certain temperate fruits and vegetables were being offered for sale in addition to traditional Thai foods. A considerable number of subsistence food plants was found especially in Klong Thoey and Aw Daw Gaw markets of Bangkok, which are close to areas where recent immigrants from country areas have settled. Levin (1992) has observed that "country foods" are popular in the rural areas of Southern Thailand, but in Bangkok are usually regarded as unsophisticated fare. However, she also found instances where such plants were considered exotic luxury items in Bangkok.

There was some variation in markets surveyed on different days. Those visited later in the day usually yielded lower counts. The bulk of produce in markets comes from large-scale commercial growers, so a predictable set of plants is

TABLE 3.—Variation in score with gender.

Age	Male		Female	
	Number	Average score	Number	Average score
10–19	121	2.4	219	2.8
20–29	118	2.7	148	2.9
30–39	21	6.5	37	6.8
40–41	19	6.9	32	7.1
50–59	16	7.4	34	7.4
60–69	8	7.4	9	7.2
70–79	3	5.3	4	7.8
80–89	0		0	
90–99	1	0.0	0	
Total[1]	307		483	

[1] age or gender was not recorded for five subjects.

available in most markets. The species encountered less frequently are typically those supplied by local farmers on an informal basis. We surveyed Tha Bo market, in Nong Khai Province, several times at approximately 8:00 am and consistently found between 65 and 70 species. When it was surveyed at 6:00 am, however, an additional 20 species were observed, including five we did not see during any other survey. Moreno-Black (1991) has observed that less common commodities are typically brought to the market early in the day (4:00 or 5:00 am), when producers can obtain cheapest transport from village to town. These are sold or traded off very quickly, an indication of the demand for the commodities.

In the interview survey, which included a photo-recognition test of ten plants, the most frequently recognized species was the very distinctive fern *Marsilea crenata*. It was correctly identified by 75.2% of the subjects (Table 2). The relationship between the frequency with which a species was found in markets, and ability of subjects to recognize it, was not strong. The patterns of response were similar in all populations, however. Two species selected because of their similarity (*Cratoxylon* and *Barringtonia*) were among the most readily recognized out of the set of ten. *Barringtonia* was mistaken for *Cratoxylon* only 2% of the time. The reverse occurred in only two instances out of 795. This suggests that people, at least within these populations, were able to interpret photographs of plants with some facility.

In almost all age groups women scored slightly higher than men (Table 3). There was a general tendency for score to increase with subject age until about 70 years, when scores of men showed a sharp decline. One possible explanation is that men lose their faculties earlier than women. Alternatively, perhaps in the past there was a dichotomy in the knowledge learned by men and women, which is now only evident in the older age classes. However, since we only interviewed eight people in this age group, a larger sample is desirable to verify the pattern of declining male knowledge. It is clear, however, that the elderly are particularly

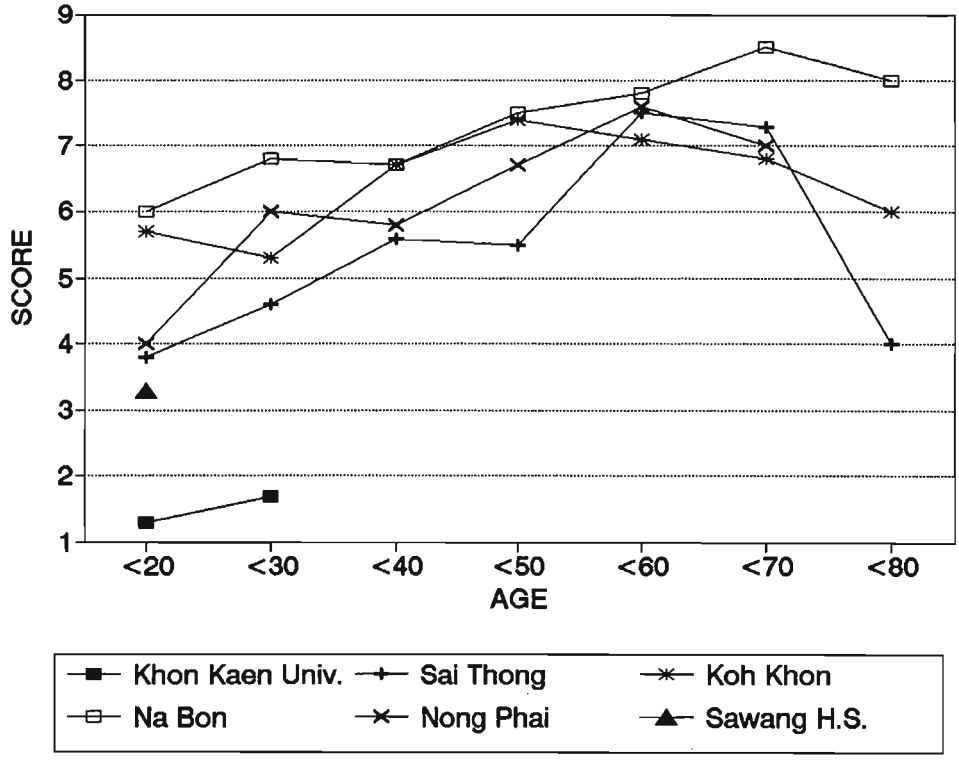

FIG. 2—Variation in scores attained in plant identification test with age.

important as depositories of information. This is supported by informants who assert that they had learned much about plants from their grandmothers.

In marked contrast to the scores of village populations were those of the two populations of students, all of whom were less than 30 years old (Fig. 2). Although scores in both student populations showed an increase with age (Table 4), those of university students were extremely low even compared to the younger high school students from the Sawang Daen Din. About 44% of the university students came from farms and village homes, so the background of this subgroup is most directly comparable to that of the high school students. However, even the university students from rural homes did not score as high as high school students who remained in the less urban environment of a small town as opposed to a city (Table 5). This would imply either that university-bound students from rural areas do not acquire traditional knowledge readily, or that they forget it when they leave the rural setting.

Variations in scores are also apparent among students from different geographical origins. Of the students surveyed at Khon Kaen University, 76% were born in the Northeast, but all regions of Thailand were represented in the sample. Those from the Northeast did better than students from other regions. Students from Bangkok and the South had the least number of correct identifications (Table 6). The higher scores of students from the Northeast may in part reflect familiarity with the local environment and food plants that are most popular in that region. It

TABLE 4.—Variation of score with age among student populations.

Age	Sawang Daen Din High School		Khon Kaen University	
	No. subjects	Average score	No. subjects	Average score
13	10	2.8		
14	40	3.1		
15	4	3.8		
16	13	3.4		
17	19	3.9		
18	14	3.6	78	1.3
19			80	1.4
20			84	1.4
21			73	2.1
22			24	1.8
23			10	1.8
Other	0		19	
Total	100		368	

TABLE 5.—Variation in score with type of home.

Nature of home	Sawang Daen Din High School		Khon Kaen University	
	No. subjects	Average score	No. subjects	Average score
Rural	61	3.7	160	2.1
Urban	36	2.7	202	1.0
No reply	3		6	
Total	100		368	

is worth noting that students from rural homes in the Northern region scored almost as well as the rural Northeasterners, perhaps reflecting the cultural and ecological similarity between the regions (Table 6). Average scores of groups from different provinces within the Northeast were highest among students from provinces that are regarded as the poorest and least developed—for example, Kalasin, Yasothon, Mukdahan, and Loei. (Table 7). It is notable that from whatever part of the country students came, those from rural homes almost invariably scored higher than those who indicated their families lived in towns or cities.

For three of the village populations, subjects were asked what level of schooling they had attained. Very few of the subjects had any high school education. In all of the village populations, subjects who had four or fewer years of elementary school education scored higher than those who completed elementary school or

TABLE 6.—Comparison of scores attained by students at Khon Kaen University according to region of origin.

Region of origin	Rural		Urban	
	No. subjects	Average score	No. subjects	Average score
Northeast	133	2.3	142	1.2
North	9	1.8	13	0.6
Central	7	1.0	12	0.8
Bangkok	1	1.0	26	0.9
South	10	1.0	9	0.2
Total[1]	202		160	

[1] Six students did not indicate whether they were from rural or urban homes.

TABLE 7.—Average scores of students at Khon Kaen University from Northeastern Provinces.

Province	Rural		Urban	
	No. of subjects	Average score	No. of subjects	Average score
Kalasin	4	3.8	7	1.4
Yasothon	5	3.6	2	2.0
Loei	2	3.5	0	–
Mukdahan	2	3.0	1	3.0
Sisaket	7	2.7	3	2.7
Roiet	9	2.5	3	1.3
Buriram	6	2.3	6	2.0
Khon Kaen	21	2.3	40	0.9
Mahasarakham	6	2.3	4	1.8
Nakhon Phanom	3	2.3	3	1.0
Sakon Nakhon	8	2.1	6	1.7
Nakhon Ratchasima	12	2.2	19	0.9
Udon Thani	23	2.2	23	1.0
Ubon Ratchthani	8	2.0	11	1.2
Chaiyaphum	5	1.6	1	0.0
Surin	7	1.6	9	1.7
Nong Khai	5	0.6	4	2.0
Total	133		142	
Average		2.2		1.2

who attended high school (Table 8). It would appear that the pursuit of formal education takes students away from agricultural pursuits where they are most likely to learn traditional plant lore. Studing takes time that might otherwise be spent producing or collecting food. Furthermore, a formal education is an urban-

TABLE 8.—Educational Attainment and Scores.

	Khon Kaen U.		Sawang H.S.		Kok Khon		Nong Phai		Sai Thong	
Education	No.	Score	No.	Score	No.	Score	No.	Score	No.	Score
0–4 years elementary					37	6.8	15	6.3	31	5.7
5–7 years elementary					10	6.1	5	6.0	17	4.6
1–6 years high school			100	3.3	7	6.1	1	6.0		
1–5 years university	368	1.5								
No record									2	
Total	368		100		54		21		50	

izing process, since the student must often live away from home in a town or city for long periods.

As a measure of economic prosperity, we asked subjects what types of vehicles their families owned (bicycle, motorcycle, truck, or car). Those with no or fewest vehicles (usually bicycles or motorcycles) had higher average scores (Fig. 3). Mobility was also measured by the number of selected places each subject had visited. The high degree of mobility of all populations was surprising. For example, more than 50% of the high school students had been to Bangkok, 1,000 km away, and many subjects had been to several foreign countries, mostly for work. In general, the people who knew the largest number of plants were those who had travelled least (Fig. 4), although the relationship did not appear as strong as with vehicle ownership. This finding may reflect the fact that the common response of the poorest people to bad times is to migrate temporarily for work.

CONCLUSIONS

An inventory of plant species present in produce markets provided information about the relative abundance and availability of fresh plant foods in a variety of communities, from major cities to small towns. Typically there are more species found in Thai markets than in the produce section of supermarkets in culturally diverse cities in the United States. Other surveys have also demonstrated the richness of available food plants and their variation from place to place in Thailand (Jacquat 1990; Moreno-Black 1991; Yongvanit et al. 1990 and Pei 1987). The largest numbers of species are found in the markets of Bangkok. Bangkok markets offered temperate fruits and vegetables relatively new to Thai cuisine, as well as some "country foods." The latter suggests that immigrants from rural areas retain a taste for plants from their homes. The high mobility of all populations studied explains why a selection of these minor food plants are found in parts of Bangkok frequented by recent immigrants.

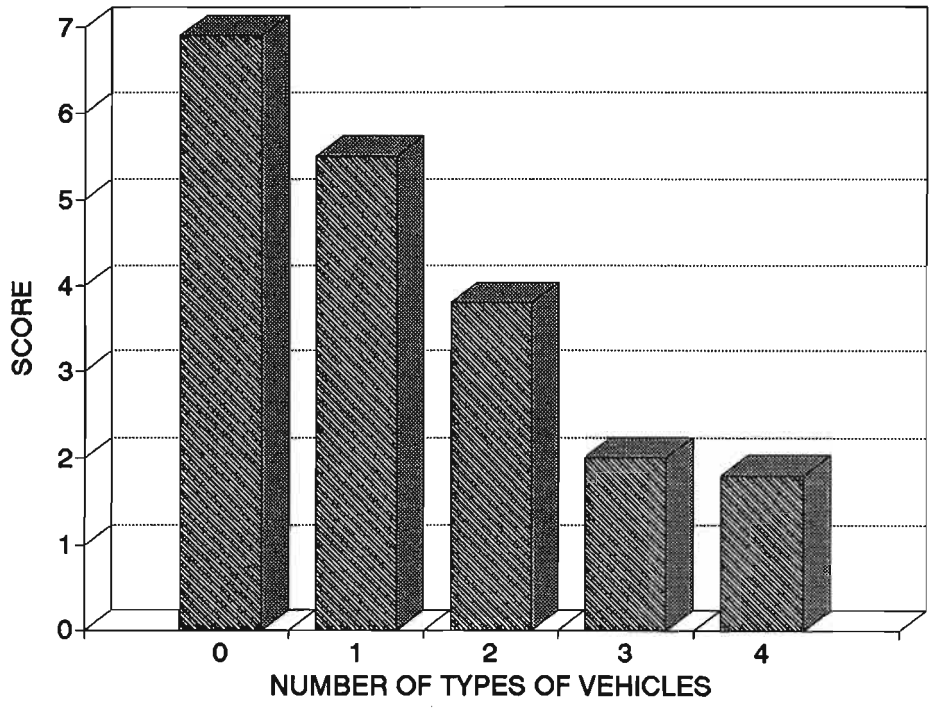

FIG. 3—Variation in scores attained in plant identification test with types of vehicles owned. A maximum of four was possible if the family owned a bicycle, a motorcycle, a car, and a truck.

Knowledge of traditional food plants, as measured by a plant identification test, was almost the exact opposite of results of most standardized tests. People who scored the highest had the least formal education. Those who did poorest were the most mobile or urbanized of the subjects and had the largest number of middle class credentials. Within each population, knowledge increased with age, but the future educated elites (present day university students) knew least of all. These results suggest that knowledge continues to be transmitted in poorest and most rural households.

In many instances the abandonment of traditional practices is not a conscious choice but the incidental result of new patterns of living. For example, as formal education occupies a larger proportion of the day for children, or as young adults migrate for extended periods to the metropolis and beyond for work or advanced education, the amount of time during which people of different generations spend together is greatly reduced, and hence the opportunities for transfer of traditional cultural information are fewer. It would appear that people still value traditional ways. For example, they return to their villages of origin on a frequent basis and often prefer to resettle there in retirement. However, it seems that the traditional connection between land and life has been significantly altered as a result of the adoption of urban values and goals and simply because individuals are absent from the locale during crucial periods of their life.

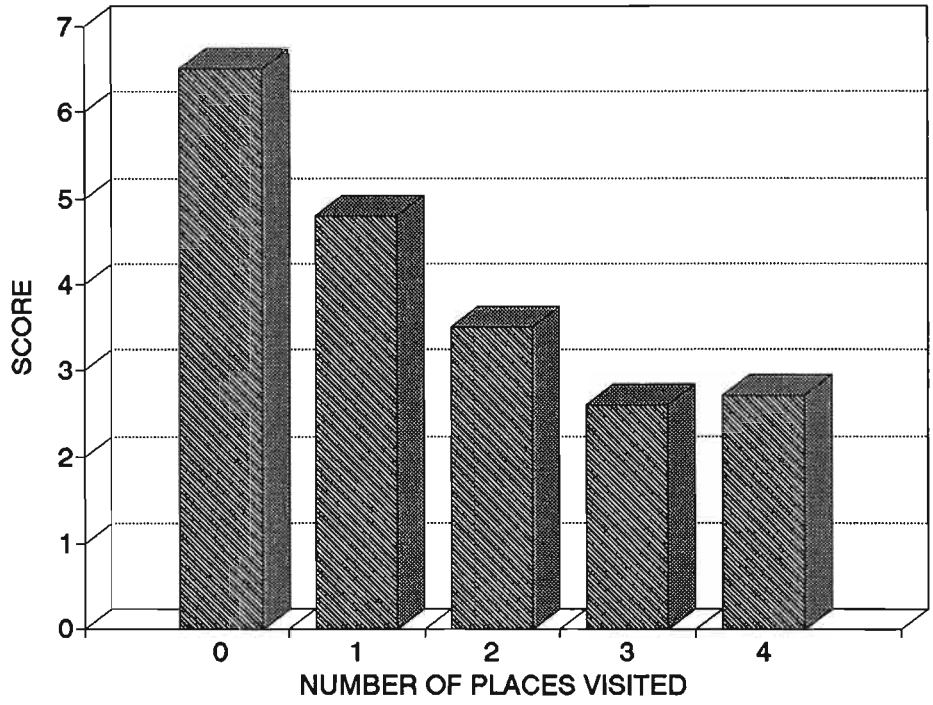

FIG. 4—Variation in scores attained in plant identification test with mobility. Mobility was measured by the number of specified places each subject had visited. A maximum of four on the scale was possible if the subject had visited Bangkok, Nakhon Ratchasima (Korat), Chiang Mai, and a foreign county.

Continued expansion of educational opportunities and increased availability of cheap transport to allow people to migrate for work to Bangkok or beyond will help to break the ties with the land and impede the transmission of knowledge about indigenous plant use. Furthermore, those likely to be responsible for the design and implementation of any official conservation program will be increasingly drawn from a generation that has acquired little appreciation of this traditional lore. In addition, some Thais make a conscious effort to distance themselves from their materially poor rural origins and the associated low social status. However, loss of traditional plant knowledge is no doubt also an unintended by-product of the strongly felt urge to modernize. If the richness of rural Thai culture, including a cuisine characterized by great variety, is to be maintained, the cultural base from which it stems must be supported, and the physical environment on which it depends protected.

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BOOK REVIEW

Edible Wild Plants of Sub-Saharan Africa: An Annotated Checklist, Emphasizing the Woodland and Savanna Floras of Eastern and Southern Africa, Including Plants Utilized for Food by Chimpanzees and Baboons. Charles R. Peters, Eileen M. O'Brien, and Robert B. Drummond. Kew, England: The Royal Botanic Gardens, 1992. Pp. 239. £15.00 (paperback). ISBN 0-947643-51-6.

As its title reveals, this is not a book, but a check list of wild edible plants—and a very specialized one at that, drawn from an unsystematically narrow literature that reflects more the life experiences of the authors than a guided intellectual inquiry (with some exceptions).

The 3-page introduction outlines the broad history of the authors' study of wild plants since its inception in the 1970s. The 200-page list of plants follows, and is divided into the major plant groupings: I. Pteridophyta, II. Spermatophyta, A. Gymnospermae, B. Angiospermae, 1. Monocotyledons, 2. Dicotyledons. Families and genera are arranged alphabetically within these groups. A short list of references is followed by an index to families and genera.

Building on their initial goal to synthesize information on indigenous wild flood plants of Africa, Peters, O'Brien, and Drummond later broadened their perspective to embrace ecological and conservation issues, and eventually were drawn to other consumers of these foods—most prominently nonhuman primates. Finally, they fixed on chimpanzees and baboons in southern and eastern Africa since these primates eat some of the same plants that local peoples do and so are regarded as "pests" and "competitors" (p. 1).

The authors emphasize eastern and southern Africa, and for humans, consult some West African references as well. Each entry in the plant list contains updated botanical nomenclature, and synonyms when those appeared in the cited reference(s). Annotation is generally limited to noting what plant part is used, and who consumes it—H, C, and B denote the reported consumption by humans, chimpanzees, and baboons, respectively. In this context it is interesting to call attention to a growing body of related, and more sophisticated studies that reveal that some of what used to be regarded as primate "feeding" behaviors are instead intentionally medicinal, cosmetic, and otherwise different from food acquisition. I mention this here to encourage a broader sphere of inquiry, not to diminish the list, which still serves its purpose as a document of "consumption."