Insertions and Deletions: Evolution in the Assemblage of Vietnamese Food Plants

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Research

Abstract

An analysis of taxa used and that are salient to Vietnamese in Hawai'i compared with southern Vietnam reflects an evolution of the assemblage of food plants demonstrated by substitutions, insertions, and deletions of plant taxa. Replications occur as the Vietnamese in Hawai'i have access to many similar plant taxa as those in Vietnam, possibly due to the location of Hawai'i as a place where similar food plants can grow and due to a large Asian population. Food plant taxa were elicited from interviews and recorded during participant observations. The current scientific botanical nomenclature and taxonomic groupings, plant life form or part utilized, the southern and many northern Vietnamese vernacular names with diacritical markings, and the English and French translations are provided for over 200 food plants. An introduction to Vietnamese diacritical writing and vernacular botanical nomenclature is included.

Introduction

Despite nearly 30 years of influence on the food, market, and garden flora of the United States, our knowledge of the food plants used by the Vietnamese is only preliminary (Airriess & Clawson 1994, Kuebel & Tucker 1988, Nguyen 2003, 2005, Owens 2003). Furthermore, while other waves of Asian immigrants (e.g., Chinese, Japanese, and Filipino) have introduced their foods there are no current published surveys of food plants sold in Asian markets in the United States although there are older reports (Chung & Ripperton 1929, Miller 1933, Porterfield Jr. 1951).

From recent reports involving Vietnamese economic and ethno- botanical studies in Vietnam (Ogle *et al*. 2003, Tanaka 2004) and in the United States (Owens 2003, Staples & Kristiansen 1999), it is evident that there is a need for a reference of accurate scientific and Vietnamese plant names. The main issue is the absence or misuse of diacritics when writing Vietnamese words. If one understands that a single stroke of the pen can change the meaning of a word from "melon fruit" to "coconut palm", one would agree that it is important to not only record, but also to share and report the accurate name. Such is the case with the names of plants in the Vietnamese language. As a native speaker and an ethnobotanist, I contend the unambiguous understanding and use of Vietnamese vernacular botanical nomenclature for laying a solid foundation for the field.

The purposes of this report are: 1) to identify food plants salient to Vietnamese in Hawai'i and southern Vietnam, 2) to analyze the plant taxa elicited through interviews in order to test the hypothesis that an 'evolution' in the assemblage of food plants salient to Vietnamese in Hawai'i has occurred as demonstrated by plant substitutions, insertions, and deletions, and 3) to provide a reference of scientific and vernacular names of food plants used by Vietnamese people that (i) is current in botanical nomenclature and taxonomic groupings, (ii) is accurate in the diacritical and tonal Vietnamese vernacular names of plants, and (iii) provides English and French vernacular

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names for cross-referencing research. I provide information for typing diacritic Vietnamese fonts at the end of this paper to facilitate accurate and efficient research and reporting,

Vietnamese Language and Vernacular Botanical Nomenclature

The Vietnamese language

Vietnamese is the national language of the Socialist Republic of Vietnam and of the **Kinh** or **Việt** ethnic group that represents the majority of diasporic Vietnamese. Vietnamese is only one of the over 90 languages spoken by the 54 ethnic groups in Vietnam but it is spoken by nearly 90% of the population. The northern (NV), central, and southern (SV) dialects are reflected by numerous examples of multiple vernacular names for a single subject and pronunciations for a single word. With the Vietnamese diaspora, the language is spoken everywhere they have settled throughout the world (SIL 2004).

Vietnamese diacritics and their importance in plant names

The Vietnamese language incorporates a system of diacritical marking that are applied to the vowels **a**, **â**, **ă**, **e**, **ê**, **i**, **o**, **ơ**, **u**, **ư**, and **y**. The alphabet also includes the consonant, "**đ**." This "**đ**" is pronounced similarly to the English "d," as in the word "dog." In contrast, the Vietnamese letter "**d**," while written the same as the English "d," is actually pronounced as the English "z," as in "zebra" (NV) or "y," as in "yellow" (SV). These diacritics are used to designate tones in spoken words and are requisite in distinguishing the meanings of otherwise similarly spelled words (Table 1). This indispensable use of diacritics to distinguish meaning is also present in the Vietnamese botanical nomenclature (Table 2). See Đinh (1976) for an in-depth analysis of the botanical nomenclature, including the Chinese and French influences.

Table 1. Tones and diacritical marks used in Vietnamese writing. Examples of their application for "**ma**" and the corresponding English translations.

Tone	Diacritic	Vietnamese	English[a]
mid-level	none	**ma**	funeral
high-rising	´	**má**	mother
low-falling	`	**mà**	but
high-rising-glottal	~	**mã**	horse
low-falling-rising	ˀ	**mả**	grave
low-falling-glottal	.	**mạ**	rice seedling

[a]English translation according to the first usage in Nguyễn and Nhóm's (2000) Vietnamese-English dictionary.

In fact, it is the French that have been most diligent (for non-Vietnam based scientists) in using diacritics in their Vietnamese botanical research. French researchers compiled extensive Vietnamese botanical literature and specimens due to France's colonization of and economic interests in Vietnam. Vietnamese names were recorded: (1) on many herbarium vouchers collected during botanical explorations (e.g., a rice cultivar (in this case with a French translation): "**lúa bông giâu**, **fleur de múrier**" on voucher 14 March 1869, *Oryza sativa* var. *mutica* Pierre 122 P!); (2) in publications concerning botany in Vietnam (cf., Crevost *et al*. 1917-1941, Đinh 1981); and (3) in publications concerning the ethnobotany of the Vietnamese in France (Simon & Simon-Barouh 1972, Walujo 1985).

Important as it is, few have been as careful in their employ of Vietnamese plant names as the French (Hodel *et al*. 1999, Kuebel & Tucker 1988, Nguyen 2003, 2004, 2005). This is notable due to the recent increase of Vietnamese ethnobotanical publications, both from studies in Vietnam (Ireson & Ireson 1996, Nguyen 2000, Ogle *et al*. 2003, Tanaka 2004) and in the United States (Airriess & Clawson 1994, Corlett *et al*. 2003, Nguyen 2000, Owens 2003, Staples & Kristiansen 1999). This increase in Vietnamese research is a contribution towards balancing a historically American continent dominated focus in ethnobotanical research publications (American continent > 40% vs. Asia <25% (Cotton 1996)). At this stage in particular, it is counterproductive for progress, to publish reports less than complete with the diacritical language. Reasons for not using diacritics include: (1) confusion regarding their correct application; (2) lack of reliable, comprehensive references to check Vietnamese names; and (3) technology difficulties (i.e., incompatible language programs and formatting difficulties in word processing programs) (personal communication, R. Owens 2003, and G. Staples 2000).

Table 2. Changes in the botanical meaning of the word "**dua**" with the application of diacritical marks. Example for the consonants, "**đ**" and "**d**" and the vowels "**u**" and "**ư**".

Consonant and Vowel	Diacritic	Vietnamese Generic	English or Latin [a]
đ + u	none	**đua**	to compete
d + u	none	**dua**	no meaning
d + ư	none	**dưa**[a]	*Cucumis* or *Citrullis*
	´	**dứa**[a]	*Ananas*
	`	**dừa**[a]	Cocos
	~	**dữa**	no meaning
	ˀ	**dửa**	no meaning
	.	**dựa**	to lean

[a]As applied with the prefix "**trái**" meaning a fruit (e.g., **trái dưa**, *Cucumis* fruit).

Vietnamese vernacular botanical nomenclature

Vietnamese vernacular botanical nomenclature may be generalized to glosses based on: (1) large taxa defined by plant form or structure utilized (Atran 1990) (Appendix A); (2) generic ranks; and (3) specific "species" or "varieties" (Berlin 1992) that may be labeled as binomials. Examples of plant names based on form or part utilized include **nấm** (mushroom), **rau** (leafy vegetable), and **trái** (fruit). Examples of generic names include **dưa** (*Cucumis*), **chuối** (*Musa*), and **cải** (*Brassica*). Examples of specific names include **dưa chuột** (*Cucumis sativa* L.), **chuối hột** (*Musa balbisiana* Colla.), and **cải ngọt** (*Brassica rapa* susp. *chinensis* (L.) Hanelt). The plant form or part utilized is also a prefix that in some cases may designate the generic name. Examples include **nấm mèo**, for the tree-ear fungus (*Auricularia* sp.), and **trái dưa chuột**, the fruit of cucumber (*C. sativa*).

The prefix is important in cases where two species of different genera or even families share a generic name. An example is the generic name **dứa** (different from **dưa** without a rising-tone diacritic) (see Table 2). The examples in Table 2 refer to meaning when combined with the prefix for a fruit, as in **trái dứa** (SV), referring to the fruit of *Ananas comosos* (L.) Merr. When it is combined with the prefix for leaf, as in **lá dứa**, it refers to the scented leaves of *Pandanas amaryllifolius* Roxb. used in cooking.

A single species may be referenced by different vernacular names corresponding to its use at different developmental stages or to distinguish the part utilized. This is well illustrated in the seeded banana, **cây chuối hột** (tree + *Musa* + seed). The staminate inflorescence, referred to as **bắp chuối** (SV) (**bắp** describes its oblong shape) or **hoa chuối** (NV) ("banana flower") and the young, green fruits, **trái chuối chát**, (fruit + banana + astringent taste) are used as raw vegetables. The fully developed seeded fruits, **trái chuối hột**, are dried and used medicinally. While the leaves, **lá chuối**, are valued for their use as a food wrapping, especially for cooking glutinous rice preparations.

Many plants introduced during the French colonial period were named with a Vietnamese life form or generic name followed by a Vietnamese version of the French name. Adopting and modifying foreign names of introduced plants is common in indigenous cultures (cf. McClatchey *et al*. 2000). To illustrate, the Vietnamese name for *Daucus carota* L., **củ cà-rốt**, is the result of combining the Vietnamese term for a root crop, bulb, or rhizome, **củ**, with the French **carotte**. Some introduced plants that are morphologically similar to traditional plants have names that reflect this morphology (e.g., **măng tây**, literal translation, "bamboo shoot of the French (or west)," otherwise known as *Asparagus officinalis* L.). The descriptor **tây**, meaning "west," was used to designate plants introduced by the French.

Writing Vietnamese diacritical characters

The Vietnamese diacritical characters in this manuscript were written in "Unicode." Writing diacritics was once problematic due to formatting and word processing difficulties. These problems have been overcome by the use of Unicode fonts and Vietnamese language programs. The Unicode Standard is an international character coding system designed to support the worldwide interchange, processing, and display of written texts of diverse languages (UNICODE 1991-2004). A number of Vietnamese language fonts and programs using Unicode are available and free to download from the Internet (UNIKEY 1991, VPS 1993-2001). Unicode characters are also available as standard symbols in Microsoft® Word and are supported by a number of applications (e.g. EndNote® 8 and newer versions). I recommend using the Unicode Standard for Vietnamese fonts (inserted either from Microsoft Word's "Insert - Symbols" menu or as the Unicode option in the font program of choice). Both methods are broadly available and transferable without formatting corruption.

Methods

Study period and sites

The food plant list presented here was compiled as part of my dissertation research on food plant knowledge and practices of Vietnamese in the United States and in Vietnam. The research was conducted from January 2002 through April 2004 in Honolulu, Hawai'i, and Biên Hòa, Vietnam. The two locations are comparable based on the following: (1) Honolulu has an established population of Vietnamese people; (2) many Vietnamese immigrants in Honolulu are originally from southern Vietnam (Nguyen 1977); (3) Biên Hòa is in southern Vietnam (ca. 30 km north of Ho Chi Minh City); and (4) both locations are urban environments with food markets (i.e., open air markets selling food plants).

Interviews and participant observation

Ethnographic, structured interviews (Spradley 1979) with informed consent (Alexiades 1996) using questionnaires (Martin 1995) were conducted with Vietnamese men and women at least 18 years of age to collect data on food plant use and culinary habits. Interviewees were selected by snowball sampling (Bernard 2002) initiated with a Vietnamese immigrant woman in Honolulu and a Vietnamese woman of similar age in Vietnam. A free listing technique was used to obtain food plant species known and used by each interviewee (Martin 1995). Food plants were demarcated by three uses: (1) "vegetables" (**rau cải**), defined as any plant part or life-form of the plant that can be eaten and is often not sweet compared to most fruits of plants (e.g., leaves, stems, corms, and mature or immature fruits of the Cucurbitaceae and Solanaceae families), (2) "fruits"

(**trái cây**), the developed ovary of a seed plant that may contain seeds, and (3) "spices and other ingredients for preparing food" (**nguyên liệu gia vị**), a plant or non-plant substance that is used to add aromatic, pungent, salty, or other additional seasoning to foods.

Participant observation (Spradley 1980) with informed consent was conducted with members of the Vietnamese communities in private homes and at public events to observe plants actually being used. This was to supplement plant data from the free-lists and to record those not listed in the interviews.

Plant collections

Vouchers of plants recorded in Hawai'i and Vietnam were collected in triplicate from some home gardens, but mostly from the produce markets of Chinatown, Honolulu (Hawai'i) and Biên Hòa (Vietnam) (Bye 1986b, Martin 1995). Vouchers were deposited at the herbaria of the University of Hawai'i (HAW) and the Institute for Ecology and Biological Resources (HN) in Hà Nội (Hanoi), Vietnam. Plants in home gardens represented by few individuals were collected singularly or in duplicate only. These specimens are deposited only at HAW. Some vouchers were recorded using only digital photography.

Many of the plants were cultivated species for which their identification is commonly known. Others were identified using the most comprehensive flora of Vietnam currently available (Phạm 1999, 2000, 2003). Specimen identifications have been confirmed by staff of BISH and HN. Accepted scientific names and the associated authorities were checked using the Missouri Botanical Garden's (n.d.) VAST (VAScular Tropicos) nomenclatural database accessed via W3TROPICOS. Current botanical family-placement was verified using APG II (2003) and the continuously updated electronic resource, the Angiosperm Phylogeny Website (Stevens 2001 onwards). The Vietnamese plant names recorded from the interviews were cross-checked using Phạm (1999, 2000, 2003) and if not included then checked in (Võ 2003). English and French names are those that occurred in descriptions of plants in Phạm (1999, 2000, 2003) and in Crevost and Lemarié (1917). Where these did not provide an English or French equivalent, some common names were available via the Multilingual Multiscript Plant Name Database (Porcher 1995-2020).

Plant taxa analysis

Descriptive statistics were used to identify plant taxa in each use-group (i.e., vegetables, fruits, and spices and other ingredients) that were listed most frequently for Hawai'i and Vietnam grouped interviews. The lists and taxa recorded during participant observations in Hawai'i and Vietnam were used to identify taxa substituted, inserted (added), and deleted (not used) in Hawai'i.

Results

Interviews

Interview responses were grouped by location, Vietnam or Hawai'i. Interviewee demographics were recorded (i.e., gender, age, occupation). As the main purpose of this report is to identify the assemblage of plant taxa used by Vietnamese location rather than the differences in plant knowledge potentially due to social characteristics (Zent & Zent 2004), an analysis based on these demographics is not included in this paper and will be discussed in a separate paper. In both locations, I began to reach a point of diminishing returns (few or no new species listed) (Martin 1995) with approximately 30 interviews. In Biên Hòa there were a total of 41 (26 female, 15 male) interviewees. In Honolulu, there were a total of 34 (25 female, 9 male) interviewees. I believe the reason for there being more female than male interviewees is due to (1) my being female and Vietnamese and (2) the snowball method used to find interviews. As a middle aged Vietnamese woman, it is culturally easier and more appropriate for me to meet and talk with women. I believe my use of the snowball sampling method resulted in higher numbers of female interviewees because the person identifying another to be interviewed often identified a friend or relative of the same gender. Interviewees from Biên Hòa listed a total 143 taxa of food plants, which included 90 taxa referred to as "vegetables" or "spices" and 53 taxa as "fruits." While in Honolulu, 67 and 43 taxa were listed for the same food plant groups.

Vietnamese food plant assemblage

The Vietnamese food plants (Appendix B) represent a compilation of the plants recorded from structured and participant interviews in Honolulu, Hawai'i and Biên Hòa, Vietnam. The checklist has been prepared with the scientific family names and Latin binomials. In some cases, taxa and names are different from those in the floras and other recent literature on food plants of Vietnam. Plant families are presented in alphabetical order so that the checklist may be most accessible to a variety of users. Fungi appear at the end of the list. Within families, genera and species are presented in alphabetical order, followed by Vietnamese names, in different dialects where applicable, and if available, in English and French. The French names are provided to facilitate research and use of the extensive French literature concerning Vietnamese economic plants. Also listed for each species is the plant part or life form reported as being utilized by informants.

Plant taxa analysis

Plant taxa lists from Hawai'i and Vietnam were used to order the frequency of taxa demarcated by the three uses:

(1) “vegetables” (**rau cải**) (Table 3), (2) “fruits” (**trái cây**) (Table 4), and (3) “spices and other ingredients for preparing food” (**nguyên liệu gia vị**) (Table 5). The vegetables and fruits tables display the top 30% of the most frequently listed plants and are discussed in the next section. The spices table includes only the order of frequency due to missing data.

Taxa substituted, inserted (added), and deleted (not used) in Hawai‘i are identified using a case studies approach. The purpose of this method is to allow for a detailed culturally informative discussion of a few notable examples and their traditional use in Vietnam compared to contemporary use or in Hawai‘i.

Discussion

Site bias

Due to the locations of the study sites, Hawai‘i and southern Vietnam, the checklist produced may be representative of plants most salient to Vietnamese of southern Vietnam origin and living in a subtropical U.S. environment with a large East and Southeast Asian population. If this study was carried out in northern Vietnam or a northern U.S. city including different demographics, the checklist produced may include different species representative of those different climatic areas and cultural make-up.

Table 3. Most frequently listed vegetables in interviews from Biên Hòa, Vietnam and Honolulu, Hawai‘i. (Approximately top 30%)

Vegetables		
	%	
Species	Biên Hòa, Vietnam	Honolulu, Hawai‘i
Brassica oleracea var. *capitata*	39	50
Brassica rapa subsp. *chinensis*	37	40
Daucus carota	37	33
Ipomoea aquatica	63	70
Lactuca sativa	54	47
Lycopersicon esculentum	32	
Mentha aquatica	-	30
Ocimum basilicum	-	43
Raphanus sativus Longipinnatus Group	-	30
Rorippa nasturtium-aquaticum	29	-
Solanum tuberosum	29	-

Plant taxa descriptions

The list of Vietnamese food plants includes over 200 taxa. More taxa were added to the list or assemblage of food plants from recordings of plants observed to be used during participant observation interviews. The majority of species represent the Brassicaceae, Cucurbitaceae, Fabaceae, and Poaceae families. Species in Rutaceae and Musaceae are used most frequently for their sweet fruits. Fungi and algae are used infrequently. They were never listed in structured interviews but were observed being used during participant interviews. The fungi observed are included in the checklist. Due to the infrequency of algae use, I did not collect algae and only mention here their Vietnamese life-form term, **rong**.

The most frequently listed vegetables (Table 3) include *Ipomoea aquatica* (L.) Lam., in both Biên Hòa and Honolulu, *Lactuca sativa* L., second most frequent in Biên Hòa and third most frequent in Honolulu, and *Brassica oleracea* var. *capitata* L. (cabbage), third most frequent in Biên Hòa and second most frequent in Honolulu. *Ipomoea aquatica* is a traditional vegetable eaten throughout Vietnam. It’s saliency in the Vietnamese culture is illustrated through proverbs associated with the vegetable. That it is also highly salient in Hawai‘i may be an artifact of the location. *Ipomoea aquatica* is an important and popular food plant for other Asian groups in Hawai‘i as well. It was noted as one of the early introductions by Asian immigrants to Hawai‘i long before the Vietnamese came (Chung & Ripperton 1929). *Lactuca sativa* and *B. oleracea* are common food plants that are in both locations. Other vegetables that were frequently listed in both locations include *Brassica rapa* subsp. *chinensis* (L.) Hanelt and *Daucus carota*.

Vietnamese in Honolulu more often list aromatic herbs (e.g., *Ocimum basilicum*, *Mentha aquatica*) as vegetables than respondents in Biên Hòa. This raises questions about the understandings and demarcations of food categories by respondents in the two locations. Indeed, the English term “vegetable” and the closest Vietnamese translation, **rau cải**, are not equivalent in their inclusion of food plants. “Vegetable” is often understood as, and was defined in this study as any plant part or life-form of the plant that can be eaten and is often not sweet compared to most fruits of plants (e.g., leaves, stems, corms, and mature or immature fruits of the Cucurbitaceae and Solanaceae families). In comparison, **rau cải** is not as comprehensive. Though, generally understood as “vegetables,” **rau cải** more specifically refers to leafy and stem vegetables. People may not consider other plant forms. For example, corms are generally referred to as **củ**, or **củ cải**, referring to the swollen roots of plants also eaten as leafy vegetables. While aromatic herbs were included in the most salient vegetables for Vietnamese in Honolulu, the same was not true for those in Vietnam. This category, **rau thơm**, meaning “aromatic leafy vegetables” includes herbaceous plants such as cilantro (*Coriandrum sativum* L.) and those in the mint

family (Lamiaceae) including mints (*Mentha* spp.) and basils (*Ocimum basilicum* L.). **Rau thơm** refers to those plants usually eaten raw as a garnish or included in the common table salad, **rau sống** (raw or uncooked vegetables that may also include raw non-leafy foods, particularly cucumbers [*Cucumis sativus* L.]). Even with these difficulties, most interviewees seemed to understand that I was interested in the broad definition of **rau cải** and included a range of "vegetables" in their listing.

Responses to listing fruits (Table 4) or **trái cây** came much easier for the interviewees. Pomelo (*Citrus maxima* (Burm. ex Rumph.) Merr.), durian (*Durio zibethinus* Rumph. ex Murray), and a common orange (*Citrus sinensis* (L.) Osbeck) are among the top three fruits named in Biên Hòa. In Honolulu, the common orange is listed most frequently, followed by apples (*Malus* sp.) and then mangoes (*Mangifera indica* L.). *Citrus. maxima* was also frequently listed in Honolulu but at a lower percentage than in Biên Hòa. Other frequently listed fruits shared between the two locations include *Musa* sp., *Vitis* sp., and *Carica papaya* L. Similar to the responses in Biên Hòa, *D. zibethinus* and *C. reticulata* are highly salient to those respondents in Honolulu, although they appear just below the 30% frequency of listing. As with the vegetables listed, the fruits results are also probably due to site bias. This is particularly so for fruits such as mangoes and pomelos that are common to Hawai'i but may not be as common in temperate U.S. cities.

Table 4. Most frequently listed fruits in interviews from Biên Hòa, Vietnam and Honolulu, Hawai'i. (Approximately top 30%)

Fruit		
	%	
Species	Biên Hòa, Vietnam	Honolulu, Hawai'i
Artocarpus heterophyllus	37	-
Carica papaya	34	47
Citrullus lanatus	34	-
Citrus maxima	54	30
Citrus reticulata	46	27
Citrus sinensis	51	82
Dimocarpus longan	32	
Durio zibethinus	51	27
Malus domestica		73
Mangifera indica	49	73
Musa sp.	41	63
Nephelium lappaceum	34	-
Psidium guajava	37	-
Pyrus sp.	37	-
Spondias cytherea	37	-
Vitis sp.	41	33

Comparing the two sites reveals that the Vietnamese in Vietnam have a greater diversity of fruits most salient or commonly used than Vietnamese in Honolulu. For the top 30%, 15 species of fruits were listed in Biên Hòa compared to seven in Honolulu. Thus, the Vietnamese in Honolulu use more frequently a smaller assemblage of fruits than Vietnamese in Biên Hòa even though many of the same fruits are available in both locations.

Due to initial difficulties I faced in my data collection for spices or ingredients used to season foods, I do not compare the percentage values of responses from Hawai'i with those from Vietnam here. A preliminary review (Table 5) indicates the spices most commonly listed in both locations include black pepper (*Piper nigrum* L.), chilies (*Capsicum annuum* L.), garlic (*Allium sativum* L.) and onions (*Allium cepa* var. cepa) in Hawai'i or shallots (*Allium cepa* var. *aggregatum* G. Don) in Vietnam. The first three spices are ingredients used to make **nước chấm**, the ubiquitous dipping sauce made with **nước mắm** (fish sauce). In Vietnam and Asian markets in the United States these plant ingredients, along with onions (*Allium* spp.) and limes [*Citrus* x *aurantiifolia* (Christm.) Swingle], are usually sold side-by-side by a single vendor providing a "one-stop shopping" situation (Figure 1). Thus Vietnamese in Hawai'i have maintained this assemblage of spice plants, except where onions are used more frequently in Honolulu as opposed to shallots in Vietnam. Vietnamese have reported the shallots are sweeter than the larger onions. This may be a substitution of onion species by Vietnamese in Hawai'i possibly due to the greater availability of the larger onions in U.S. markets.

Table 5. Seven most frequently listed spices in interviews from Biên Hòa, Vietnam and Honolulu, Hawai'i. Listed by order of frequency in each location (1=most frequent).

Spices		
	Order	
Species	Biên Hòa, Vietnam	Honolulu, Hawai'i
Allium cepa var. *cepa*	-	4
Allium cepa var. *aggregatum*	4	-
Allium fistulosum	6	5
Allium sativum	3	1
Capsicum annuum var. cf. *longum/frutescens*	2	3
Citrus x *aurantiifolia*	5	6
Cymbopogon citratus	7	-
Piper nigrum	1	2
Zingiber officinalis	-	7

Figure 1. Spices vendor with an assemblage of plant species often used together to make the dipping sauce, **nước chấm**. Hanoi, Vietnam.

Figure 2. *Persicaria odorata* (Lour.) Soják (**rau răm**, Vietnamese mint).

Substitution for aroma and taste

Persicaria odorata (Lour.) Soják (**rau răm**, Vietnamese mint, indigenous to Southeast Asia) (Figure 2). It is used most notably and traditionally in salad dishes, called **gỏi** and as an accompaniment with the partially developed duck egg dish, **hột vịt lộn** (Figure 3). It is listed as a recent introduction by Vietnamese immigrants (Kuebel & Tucker 1988) and is not included in a checklist of Asian food plants in Hawai'i (Chung & Ripperton 1929), or other Hawai'i plant lists before 1975 (Neal 1965, St. John 1973). In the United States, I have not observed the partially developed duck egg dish being consumed. However, I am told that it is available in the markets in Chinatown in Honolulu and other areas with large Vietnamese communities. Regarded as a snack food, it is neither described in Vietnamese cookbooks from the United States (Miller 1968, Ngô & Zimmerman 1986, Nhan & Sox 2003) nor Vietnam (Nguyễn 2003, Triệu 1999, Văn 1984). For salads included in the cookbooks from the United States, the aromatic "herbs" *Coriandrum sativum* (indigenous to Southwest Asia) and/or *Ocimum basilicum* (indigenous to the old-world tropics) is commonly listed rather than *P. odorata*. For example, green papaya salad (**gỏi đu đủ**) is prepared with *O. basilicum* rather than *P. odorata*. While *P. odorata* is available in the Chinatown markets in Honolulu, its use appears to be limited and I have never observed it used as an ingredient in Vietnamese restaurants in Hawai'i. Only during participant observations with the Vietnamese group of Đồng Tâm Baptist Church, and during meals in Vietnam have I eaten **gỏi** with *P. odorata*. It is also the women of the Đồng Tâm group that stress that Vietnamese salads must have *P. odorata* in order to be genuinely and properly prepared, **gỏi**, with the proper taste. According to traditional Vietnamese use, *P. odorata* aids in the digestion of the partially developed duck eggs. Its antibacterial properties (Nguyễn 1993) may explain its traditional use in raw salads that may harbor harmful bacteria.

Deletion and substitution used for color

Momordica cochinchinensis (Lour.) Sprengel (**gấc**, indigenous to India, Japan to New Guinea). This spectacular fruit (Figure 4), is related to bitter melon (*M. charantia* L.). The thick, red arils of the large seeds are used to impart an orange-red color to the glutinous rice dish, **xôi gấc**. **Xôi gấc** is traditionally served for celebrations such as wed-

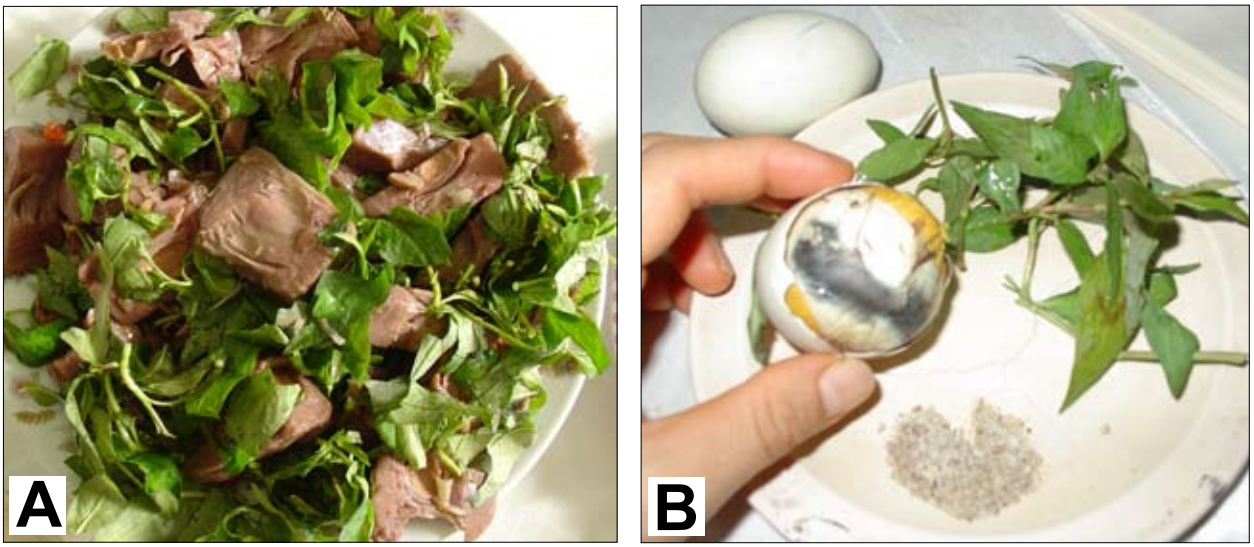

Figure 3. *Persicaria odorata* traditionally used for: (A) **gỏi**, salad dishes, (pictured is a **gỏi** made with *Artocarpus altilis* (Z.) Fosb., beadfruit); and (B) as an accompaniment in **hột vịt lộn**.

Figure 4. *Momordica cochinchinensis* (Lour.) Sprengel (**gấc**). The thick, red arils of the large black seeds are used to impart a red coloring to food.

dings, **đầy tháng** (the celebration of exactly one month old of a baby), and **Tết** (Lunar New Year). The aril covered seeds are first soaked in rice liquor. The arils are then removed from the hard seeds and mixed with uncooked glutinous rice that has been soaked in water and the mixture is steamed. Coconut milk is added to sweeten this food. The black hard seeds are not eaten as they are removed prior to or during the mixing stage. A number of seeds may be left in the mixture or are reserved to be used as decoration on top of the cooked **xôi gấc** (Figure 5A). This is done as evidence that *M. cochinchinensis* was indeed used to impart the coloring versus an artificial food coloring. In Hawai'i, at every Vietnamese celebration where a pink to red colored glutinous rice dish was available, I have been told it is "**xôi gấc**" and upon asking, I am told "[artificial] color is added" to make it red. The food coloring imparts a light red to pink hue rather than the orange-red produced when using the arils of *M. cochinchinensis* (Figure 5B).

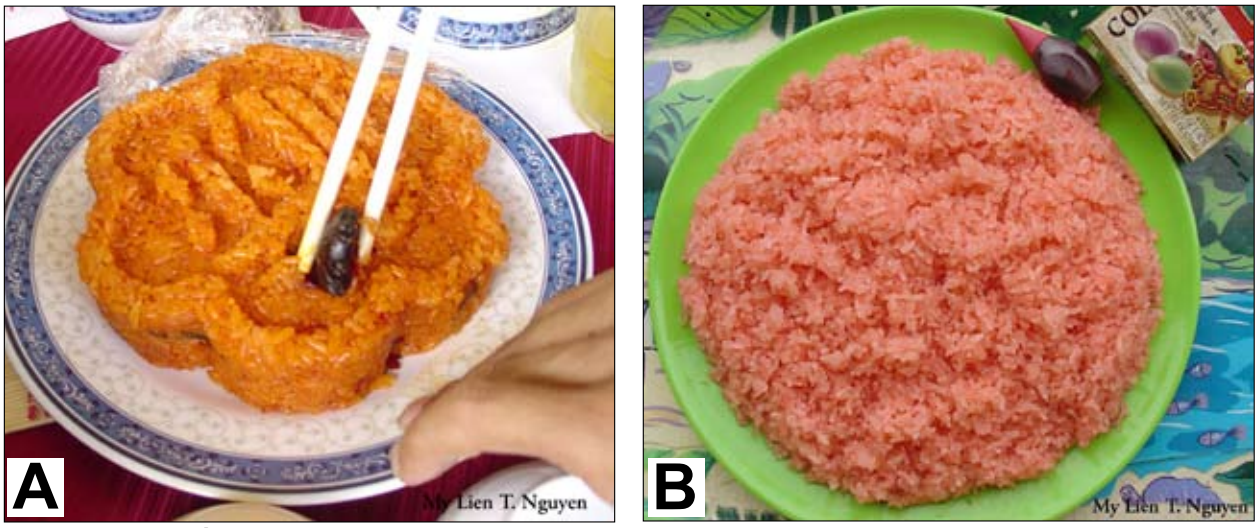

Figure 5. A) **Xôi gấc** served at a wedding in Vietnam. A *Momordica cochinchinensis* seed left in the glutinous rice mixture as proof of *M. cochinchinensis* use is being removed just before eating the food. B) Artificially colored "**xôi gấc**" repared with red food coloring (also shown in the figure) that produced the pink color. This dish was prepared for a Vietnamese celebration in Hawai'i.

Figure 6. *Pandanus amaryllifolius* Roxb. (**lá dứa**, scented pandanus) cultivated on a Vietnamese farm in Hawai'i (plants in foreground).

While the genuine use *M. cochinchinensis* for the red of **xôi gấc** is important in Vietnam, its deletion in Hawai'i due to unavailability and subsequent substitution with food coloring does not appear culturally important for Hawai'i based Vietnamese. In February 2005, I attended a celebration of the first full year of a baby where **xôi gấc** was prepared using powered *M. cochinchinensis*. The powered preparation of the *M. cochinchinensis* arils has recently become available in Vietnam and was brought back to Hawai'i by a Vietnamese woman. The powder gave the glutinous rice the deep orange-red color similar to what I have observed when the fresh arils are used. This powder is not available in Hawai'i and may become another product soon to be imported for Vietnamese immigrants.

Pandanus amaryllifolius Roxb. (**lá dứa**, scented pandanus, indigenous to the old world tropics, possibly first found in the Moluccas). *Pandanus amaryllifolius* leaves are used to perfume and to impart a green color to foods. For example, both scent and coloring properties are used to make a sweet food called, **chè sôi nước**, which consists of green colored spheres filled with sweetened mung bean paste. The green spheres are made with glutinous rice flour traditionally colored using water boiled with *P. amaryllifolius*. In Hawai'i, **chè sôi nước** is often made with green food coloring even though *P. amaryllifolius* is available (Figure 6). As with *M. cochinchinensis*, the substitution of *P. amaryllifolius* is explained to me without much empathy for traditionalism. For these two examples in Hawai'i, the convenience of the artificial food coloring outweighs the traditionalism of the plant use. The substitution of coloring for *M. cochinchinensis* is compounded by its unavailability in Hawai'i.

Substitutions, insertions and deletions for texture

Colocasia gigantea (Blume) Hook. f. (**bạc hà**, often referred by "taro stem," indigenous to Indomalasia to Australia) (Figure 7). *Colocasia gigantea* is valued for the spongy aerenchyma and crunchy texture of its petiole (Nguyen 2005). The petiole has no flavor of its own, but absorbs the broth of the soup it is specifically cooked in, **canh chua cá lóc** (sweet and sour snakehead mullet fish soup). The ingredients used to make **canh chua cá lóc** provide its characteristic balance of sourness, sweetness, and spiciness. These combinations are important characteristics of Vietnamese food (Đinh 1990a; Pham 2001; Trieu 1998). Less discussed is the necessity of certain plants to provide texture, as is the function of *C. gigantea* in this soup.

Vendors in Biên Hòa identified plant taxa used as substitutes for *C. gigantea* in **canh chua** (Table 6). Like *C. gigantea*, these plants have little or no flavor and absorb the flavor of the soup. Species A through D have aerenchyma, and thus have the texture quality coveted for *C. gigantea* (Figure 8). The plants listed for Honolulu are those I have observed in use. *Apium graveolens* var. dulce (Miller) Pers. is listed as an insertion in Honolulu because I did not observe it used or available in southern Vietnam. The

Figure 7. *Colocasia gigantea* (Blume) Hook. f. (**bạc hà**) cultivated in Hawai'i.

Table 6. Plant taxa substitutions for *Colocasia gigantea*, deletions and insertions for making **canh chua**.

Standard	**Biên Hòa[a] substitutions**	**Honolulu insertions**
Colocasia gigantea (Blume) Hook.f.	A) *Limnocharis flava* (L.) Buchenau	1) *Apium graveolens* var. *dulce* (Miller) DC
	flowering shoots of "**keo neo**"	petiole
petiole used	B) *Nelumbo nucifera* Gaertner	2) bamboo shoots
	shoots of "sacred lotus"	canned
	C) *Nymphaea pubescens* Willd.	
	flowering shoots of "night lotus"	
	D) *Neptunia prostrata* (Lam.) Baillon	
	whole plants, spongy stems	
	E) bamboo shoots from Mekong Delta region:	
	pickled	
	F) *Sesbania grandiflora* (L.) Pers.	
	blossoms	
	G) *Sesbania sesban* (L.) Merr.	
	blossoms	
a Deletions from Hawai'i **canh chua** use are A, B, C, D, and G.		

Figure 8. Texture substitutes for *C. gigantea* with aerenchyma: A) *Limnocharis flava* (L.) Buchenau, B) *Nelumbo nucifera* Gaertner., C) *Nymphaea pubescens* Willd., D) *Neptunia prostrata* (Lam.) Baill.

bamboo listed for Honolulu is cooked and canned versus a pickled preparation in Biên Hòa.

The *C. gigantea* substitutes that occur in Biên Hòa, except bamboo shoots and *Sesbania grandiflora* (L.) Pers., are not available in the Honolulu's Chinatown markets, and thus are considered to be "deleted" from the Hawai'i based Vietnamese food plant assemblage. *Nelumbo nucifera* Gaertner in the form of the "lotus roots" are available in Chinatown, but the shoots as they are used for **canh chua** are not available. *Neptunia prostrata* (Lam.) Baill. is available in Chinatown, but I have never observed its use for **canh chua**. It is possible that *N. prostrata* was deleted from the assemblage of **canh chua** plants because it was not available when the Vietnamese first began to make this food in Hawai'i, and subsequently the knowledge of its application for canh chua was forgotten by many.

Sesbania grandiflora (L.) Pers. and *Sesbania sesban* (L.) Merr. are ingredients characteristic to **canh chua** of the Mekong Delta (in Vietnamese known as **miền tây**). *Sesbania sesban* flowers are described as available only during the flood season and growing along the water ways of the Mekong Delta where people use small boats to collect them from semi-aquatic *S. sesban* plants. *Sesbania grandiflora*, grows in Hawai'i, is sold in the Chinatown markets by Filipino vendors, and is used by Filipinos as a vegetable. I have observed its use for **canh chua** in Hawai'i infrequently by Vietnamese originally from the Mekong Delta region.

In recent years, the improved economic situation in Vietnam and for many Vietnamese immigrants in Hawai'i, has enabled people to include in **canh chua** a greater variety of ingredients and include those formally more expensive [e.g., pineapple (*Ananas comosus* (L.) Merr.) and okra (*Abelmoschus esculentus* (L.) Moench)] (Mrs. Nguyễn Thị Nhơn, personal interview 2004). As a result, different species of vegetables, herbs and fish (and other meats) are now more commonly used in **canh chua** in Vietnam and in the United States. The plant and animal species used for **canh chua** have been substituted, deleted and others inserted in their place, but the characteristics of the soup remain constant: sour, sweet, spicy, and a texture - pro-

vided by the aquatic associated plants with aerenchyma, bamboo, or celery.

Conclusions

This paper provides an explanation of Vietnamese diacritics and their importance to meaning and application in Vietnamese vernacular plant names. It is hoped that the compilation of Vietnamese food plants will be useful to those working in Vietnamese economic botany or ethnobotany as a reference of the current scientific nomenclature and taxonomic groupings, the fully scribed Vietnamese names, and the English and French equivalents. As the interest in Vietnamese ethnobotany grows, it is important to be accurate and unambiguous in our research and reports. Equally important, that a greater understanding of the food practices and culture can be learned and preserved through the active use of the Vietnamese language by those that are interested, Vietnamese or otherwise.

The list of Vietnamese food plants also serves to fill a gap in the literature regarding food plants used by Vietnamese immigrants. With the collection of many of the plants in this study from Hawai'i's Chinatown markets, the data also serves as a preliminary checklist of plants available in Asian markets in the United States. This working list will evolve as additional names are added to include other plant life forms (e.g. algae) and uses (e.g. medicinal), and to accommodate the dynamic nature of botanical nomenclature.

An analysis of taxa used and that are salient to Vietnamese in Hawai'i compared with southern Vietnam reflects an evolution of the assemblage of food plants demonstrated by substitutions, insertions, and deletions of plant taxa. Replications are also evident as the Vietnamese in Hawai'i have access to many similar plant taxa as those in Vietnam. This is likely due to the location: with a subtropical climate where similar food plants can grow, and demographically, where taxa are available due to the food plants demands of the large Asian population.

Some notable substitutions, deletions, and insertions of plant taxa demonstrate that the Vietnamese in Hawai'i have continued to make foods that are culturally important even in the absence of particular plant taxa. This shows that the importance of some foods is not in the species that are required, but rather the qualities of the plant (e.g., crunchy, spongy aerenchyma of *Colocasia gigantea*). The adaptation facilitates the food preparation or replication, maintaining Vietnamese culinary traditions.

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Appendix A. Vietnamese terms for plant form and structure utilized.

Vietnamese terms[a]	English Explanations
bông (SV), **hoa** (NV)	flower
cải	cabbage groups; often Brassicaceae generic
cây	generic for "a plant" or tree; often used as a generic for food plants with erect vegetative parts
cộng	petiole or stem
củ	bulb, root, tuber, or rhizome
đậu	bean; often Fabaceae generic
hột (SV), **hạt** (NV)	seed, grain
lá	leaf
nấm	fungus
ngó	shoot of aquatic plant
rau[b]	"vegetable" or vegetative, sterile, often leafy food plant
rong	algae
trái (SV), **quả** (NV)	fruit

[a]Only those discussed in this manuscript.
[b]I include in the checklist the form "**rau t**" as an abbreviation for **rau thơm**, referring to plants with aromatic (**thơm**) vegetative parts used as condiments.

Appendix B. Vietnamese Food Plants with Vietnamese, English, and French Names.

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
ALISMATACEAE				
Limnocharis flava (L.) Buchenau	**rau**	**kèo nèo**	?	?
ALLIACEAE				
Allium cepa var. *aggregatum* G.Don	**củ**	**hành ta**	shallot	**echalotte**
	bông	**bông hành**	onion flower	**oignon fleurit**
Allium cepa var. *cepa* L.	**củ**	**hành tây**	onion (bulbs)	**oignon**
Allium chinense G. Don.	**củ**	**củ kiệu**	Chinese onion	**oignon chinoise**
Allium fistulosum L.	**rau t**	**'hành lá'**	green onion, spring onion	**ciboule**
Allium porrum L.	**cây**	**tỏi tây**	leek	**poireau**
Allium sativum L.	**củ**	**tỏi**	garlic	**ail**
Allium tuberosum Rottler ex. Sprengl	**rau t**	**'hẹ'**	Chinese chives	**ail odorant**
	bông	**bông hẹ**	Chinese chives flowers	?
AMARANTHACEAE				
Amaranthus tricolor L. 'Red Stripe Leaf'	**rau**	**rau dền**	Chinese amaranth	**amarante comestible**
Amaranthus tricolor L. var. *splendens* hort.	**rau**	**rau dền lua**	red amaranth	**brède de Madagascar**
Beta vulgaris L. subsp. *vulgaris*	**củ**	**dền, dền tím Đà Lạt**	beet	**betterave**
Spinacia oleracea L.	**cải**	**bó xôi (SV)**	spinach	**épinard**
		'rau dềnh mỹ' (Hl)		
ANACARDIACEAE				
Anacardium occidentale L.	**hột**	**điều**	cashew nut	**noix de caju; anacarde**
Mangifera indica L.	**trái**	**xoài**	mango	**manguier**
Spondias cytherea Sonn.	**trái**	**cóc, vì (Hl)**	hog plum	**pomme cythère**
ANNONACEAE				
Annona muricata L.	**trái**	**mãng cầu xiêm**	soursop	**corossol**
Annona squamosa L.	**trái**	**mãng cầu ta**	custard apple, sweet sop	**pomme-cannell**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
APIACEAE				
Anethum graveolens L.	**lá**	**thì là**	dill leaves, fennel	**fenouil bâtard**
Apium graveolens L. var. *dulce* (Miller) DC	**rau**	**cần tâu, cần tây**	celery	**céleri**
Centella asiatica (L.) Urb.	**rau**	**rau má**	pennywort	**-**
Coriandrum sativum L.	**rau t**	**'ngò' (SV)**	cilantro	**coriandre**
		rau mùi (NV)		
Daucus carota L.	**củ**	**cà rốt**	carrot	**carotte**
Eryngium foetidum L.	**rau t**	**'ngò gai' (SV)**	thorny coriander	**panicaut fétide**
		'mùi tau' (NV)		
Oenanthe javanica DC	**rau**	**cần nước/ta, ngò tàu**	Chinese celery	**persil séri**
APOCYNACEAE				
Aganonerion polymorphum Pierre ex Spire	**rau**	**rau dang (SV)**	?	?
		rau vang (NV)		
ARACEAE				
Colocasia esculenta (L.) Schott	**củ**	**khoai môn (SV)**	taro	**taro**
		khoai sọ (NV)		
Colocasia esculenta (L.) Schott 'Bun Long'	**củ**	**khoai môn tầu/cao**	Chinese taro	**taro**
Colocasia gigantea (Blume) Hook. f.	**cộng**	**bạc hà (SV)**	taro petiole (of Giant elephant	**kane thuon**
		dọc mùng (NV)		
ARECACEAE				
Areca catechu L.	**trái**	**cau**	betel nut	**aréquier**
Arenga pinnata (Wurmb.) Merr.	**cây**	**đoát, bụng báng**	sugar palm	**palmier à sucre**
Borassus flabellifer L.	**cây**	**thốt lốt**	palmyra palm (sugar)	**palmier à sucre**
Cocos nucifera L.	**trái**	**dừa**	coconut	**cocotier**
ASPARAGACEAE				
Asparagus officinalis L.	**rau**	**măng tây**	asparagas	**apserge**
ASPHODELACEAE				
Aloe vera (L.) Burm. f.	**cây**	**cây đam, nha đam**	aloe vera	**aloès**
ASTERACEAE				
Chrysanthemum coronarium L.	**rau**	**tần ô (SV)**	chrysanthemum greens	**chrysanthemum des Jardin**
		cải cúc (NV)		
Cynara scolymus L.	**bông**	**a-ti-sô**	artichoke	**artichaut**
Lactuca sativa L. cv.	**rau**	**xà lách búp (SV)**	lettuce (round cv.)	**laitue**
		diếp (NV)		
Lactuca sativa L. cv.		**xà lách gài (SV)**	lettuce (long cv.)	

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
BASELLACEAE				
Basella rubra L.	**rau**	**mồng tơi**	Malabar spinach	**epinard de Malabar**
BIGNONIACEAE				
Cresentia cujete L.	**trái**	**đầo tiên**	calabash tree	**calebrassier**
BIXACEAE				
Bixa orellana L.	**hột**	**điều đỏ/nhuộm**	anatto seeds	**rocouyer**
BRASSICACEAE				
Brassica juncea (L.) Czern.	**cải**	**cải sạy (SV)**	mustard cabbage	**moutarde indienne**
		'rau cải' (NV)		
	cải	**cải bẹ xanh**	mustard cabbage (small leaf)	**moutarde indienne**
Brassica oleracea L.				
var. *acephala* DC.	**cải**	**cải rỗ**	collard	**chou cavalier**
var. *botrytis* L.	**cải**	**'bông cải', súp lơ**	cauliflower	**chou-fleur**
		'bông cải xanh'	broccoli	**chou-fleur d'hiver**
var. *capitata* L.	**cải**	**'bắp cải'**	cabbage	**chou cabus**
var. *chinensis* (L.) Prair	**cải**	**cải dung/nhúng**	Chinese kale	**broccet de Chine**
var. *gongylodes* L.	**cải**	**su-hào**	kohlrabi	**chou-rave**
Brassica rapa L. subsp. *chinensis* (L.) Hanelt	**cải**	**cải bẹ-trắng**	bok choy (narrow petiole)	**chou chinois blanc**
		cải thìa	bok choy (broad petiole)	**chou chinois**
		cải ngọt	choy sum, yellow flowering	**chou chinois**
subsp. pekinensis (Lour.) Hanelt		**cải bắc thảo/ bắp dài**	Chinese cabbage, (long white) won bak	**chou (blanc) de Pékin**
Raphanus sativus Bailey cv. Longipinnatus	**củ**	**củ cải trắng**	daikon	**radis-navet**
Rorippa nasturtium-aquaticum (L.) Hayek	**cải**	**cải xaong/ soong**	watercress	**cresson de fontaine**
		xà lách son		
BROMELIACEAE				
Ananas comosus (L.) Merr.	**trái**	**khóm, thơm (SV)**	pineapple	**ananas**
		dứa (NV)		
CACTACEAE				
Hylocereus undatus (Haw.) Britton & Rose	**trái**	**than long, tường liên**	dragon fruit	**oeil de dragon**
CARICACEAE				
Carica papaya L.	**trái**	**đu đủ, đu đủ xanh**	papaya, green papaya	**papayer**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
CLUSIACEAE				
Calophyllum sp.	**trái**	**mù-u**	Alexander laurel wood	**laurier d'Alexandrie**
Garcinia mangostana L.	**trái**	**măng cụt**	mangosteen	**mangoustanier**
CONVOLVULACEAE				
Ipomoea batatas (L.) Lamk.	**củ**	**khoai lang**	sweet potato	**patate douce**
	rau	**rau lang/lang đỏ**	sweet potato leaves/red leaves	
Ipomoea aquatica Forrsk cv.	**rau**	**rau muống (hột)**	water spinach (seed, land)	**liseron d'eau**
		rau muống (ruong)	water spinach (paddy)	
CUCURBITACEAE				
Benincasa hispida (Thunb.) Cogn.	**trái**	**bí đao, bí**	wax gourd, Chinese winter melon	**courge cireuse**
Citrullus lanatus (Thunb.) Matsum & Nakai	**trái**	**dưa hấu, dưa đỏ**	watermelon	**pastèque**
		dưa hương/ hấu non	watermelon (very young)	
Coccinia grandis (L.) Voigt.	**lá**	**bình bát, bát**	ivy gourd	**gourde écarlate de l'Inde**
Cucumis melo L. var. *cantalupo* Ser.	**trái**	**dưa gang tây**	canteloupe	**cantaloup**
Cucumis sativus L.	**trái**	**dưa chuột/leo**	cucumber	**concumbre**
var. *sativus* Chinese Group	**trái**	**dưa gang**	netted yellow cucumber	**concombre brodé de Chine**
Cucurbita pepo L.	**trái**	**bí đỏ**	pumpkin	**courgette**
	bông	**bông bí**	pumpkin blossoms	**courge-fleur**
var. *medullosa* Alef.	**trái**	**bầu tây**	zucchini	**courgette**
var. *moschata* Duchesne ex Lam.	**trái**	**bí rợ**	Japanese pumpkin	**courge musquée, giraumon**
Lagenaria siceraria (Mollina) Standley	**trái**	**bầu**	bottle gourd	**courge bouteille**
	lá	**lá bầu**	bottle gourd leaves	**feuilles de courge bouteille**
Luffa acutangula (L.) Roxb.	**trái**	**mướp khía**	ridged gourd, sing-kwa	**courge anguleuse de Chine**
Luffa aegyptiaca Mill.	**trái**	**mướp hương**	sponge gourd, loofah	**eponge végétale**
Momordica charantia L.	**trái**	**khổ qua(SV)**	bitter melon, balsam pear	**margose amère**
		mướp đắng(NV)		
Momordica cochinchinensis (Lour.) Sprengel	**trái**	**gấc**	spiny bitter cucumber	**muricie, margose à piquants**
Sechium edule (Jacq.) Sw.	**trái**	**su su, chu chu**	chayote	**cheyotte**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
CUCURBITACEAE (cont.)				
Trichosanthes cucumerina L.	**trái**	**mướp tây**	snake gourd	**serpent végétal**
Zehneria indica (Lour.) Keyr.	**trái**	**chùm thắng/ trắng**	Indian zehneria	?
DIOSCOREACEAE				
Dioscorea alata L.	**củ**	**khoai mơ/tím**	yam (purple inside)	**grande igname**
Dioscorea esculenta (Lour.) Burkill	**củ**	**khoai từ**	yam (Chinese -)	**igname des Chine**
Dioscorea sp.	**củ**	**khoai mọi**	yam cv.	**igname**
EBENACEAE				
Diospyros kaki L.f.	**trái**	**hồng**	persimmon	**kaki**
EUPHORBIACEAE				
Manihot esculenta Crantz	**củ**	**khoai mì**	cassava	**manioc**
FABACEAE				
Arachis hypogaea L.	**đậu**	**đậu phộng (SV)**	peanut	**arachide**
		'đỗ lạc' (NV)		
Erythrina variegata L.	**lá**	**vông nem**	Indian coral tree	**arbe immortel**
Glycine max (L.) Merr.	**đậu**	**đậu nành**	soy bean	**soya**
Neptunia prostrata (Lam.) Baill.	**rau**	**rau ngúc/ngút**	neptunia	**neptunie potagère**
Pachyrhizus erosus (L.) Urb.	**củ**	**củ sắn (SV)**	yambean tuber	**dolique bulbeuse**
		củ đậu (NV)		
Phaseolus vulgaris L.	**đậu**	**đậu ve/cô ve**	French bean	**haricot vert**
Pisum sativum L.	**đậu**	**đậu petit pois/ hòa lan**	pea	**petit pois**
Pisum sativum L. var. *macrocarpon* Serr.	**đậu**	**đậu tí bo**	snap/snow peas (podded)	**pois mangetout à cosse plate**
Psophocarpus tetragonolobus (L.) DC	**đậu**	**đậu rồng**	winged bean	**pois carre**
Pueraria montana (Lour.) Merr. var. *lobata* (Willd.) Maesen & S. Almeida	**củ**	**cát căn (SV)**	kudzu	**kudzu dolique**
		sắn dây (NV)		
Sesbania grandiflora (L.) Pers.	**bông**	**bông so đũa**	sesban	**sesbanie**
Sesbania sesban (L.) Merr.	**bông**	**bông điên điển**	Indian sesbania	**sesbanie d'Egypte**
Tamarindus indica L.	**trái**	**me (chua)**	tamarind (sour)	**tamarinier**
		me (ngọt)	tamarind (sweet)	
	lá	**lá me**	tamarind leaf shoots	**feuilles de tamarin**
Vicia faba L.	**đậu**	**đậu tâu-kê/ răng-ngựa**	broad bean	**fève**
Vigna angularis (Willd.) Ohwi & Phashi	**đậu**	**đậu đỏ, đậu đen**	adzuki beans (red, black)	**haricot adzuki (pourpre, noir)**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
FABACEAE (cont.)				
Vigna radiata (L.) R. Wilczek	**đậu**	**đậu xanh**	mung bean	**haricot mung à grain doré**
	rau	**giá**	mung bean sprouts	**germe de soja**
Vigna unguiculata subsp. unguiculata (L.) Walp.	**đậu**	**đậu trắng**	cowpeas (black-eyed peas)	**doliques à oeil noir**
Vigna unguiculata (L.) Walp. subsp. *sequipedalis* (L.) Verdc.	**đậu**	**đậu đũa**	yard long beans	**dolique asperge**
HEMEROCALLIDACEAE				
Hemerocallis fulva (L.) L.	**bông**	**kim châm (SV)**	lily buds	**hémérocalle**
		'hoa hiên' (NV)		
IRIACEAE				
Eleutherine subaphylla Gagnep.	**củ**	**sâm đại hành, tỏi đỏ**	red garlic	?
LAMIACEAE				
Elsholtzia ciliata (Thunb.) Hyl.	**rau t**	**'kinh giới'**	Vietnamese perilla	?
Mentha aquatica L.	**rau t**	**'húng lũi'**	creeping or water mint	**menthe aquatic**
Mentha arvensis L.	**rau t**	**'húng cây'**	corn-mint	**menthe des champs**
Ocimum basilicum L.	**rau t**	**'húng quế', 'rau quế'**	Asian/Thai basil	**basilic**
	hột	**hột é**	Asian/Thai basil seeds	**graines de basilic**
Perilla fructescens (L.) Britt.	**rau t**	**'lá tía tô'**	perilla, chiso	**pérille**
Plectranthus amboinicus (Lour.) Spreng.	**lá**	**lá cân dày**	plectranthus, Cuban oregano	**plectranthus aromatique**
LAURACEAE				
Cinnamomum sp.	**cây**	**quế đơn**	cinnamon	**cannelle**
LYTHRACEAE				
Punica granatum L.	**trái**	**lưu**	pomegranate	**grenadier**
MALPIGHIACEAE				
Malpighia glabra L.	**trái**	**sơ ri**	Barbados cherry	**moureiller**
MALVACEAE				
Abelmoschus esculentus (L.) Moench	**đậu**	**đậu bắp**	okra	**gombo**
Corchorus olitorius L.	**rau**	**rau đây/bố/đai**	Jew's mallow, Tossa Jute	**corète potagère jute**
Durio zibethinus Rumph. ex Murray	**trái**	**sầu riêng**	durian	**durion**
Theobroma cacao L.	**cây**	**ca-cao**	cacao tree	**cacaoyer**
MARANTACEAE				
Maranta arundinaceae L.	**củ**	**huỳnh tinh, bình tinh**	West Indies arrowroot	**arrow-root**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
MELIACEAE				
Lansium domesticum Corrêa	**trái**	**bòn bon**	langsati	**langsep**
MENISPERMACEAE				
Cyclea peltata (Lamk.)Hook.f. & Thomson	**lá**	**sâm nam, dây sâm**	?	?
MORACEAE				
Artocarpus altilis (Park.) Fosb.	**trái**	**xa kê**	breadfruit	**arbre-à-pain**
Artocarpus heterophyllus Lam.	**trái**	**mít (ước, ráo)**	jackfruit (wet & dry cvs.)	**jacquier**
Artocarpus integer (Thunb.) Merr.	**trái**	**mít tố nữ**	champedak	**jacquier champeden**
MORINGACEAE				
Moringa oleifera Lam.	**trái**	**chùm-ngây**	moringa, horse-radish tree	**moringa ailée**
MUNTINGIACEAE				
Muntingia calabura L.	**trái**	**trái trứng cá, mật sâm**	calabura, jamaica cherry	**calabure**
MUSACEAE				
Musa acuminata x *balbisiana* Colla (synonym for *M.* x *paradisiaca* L.)				
cf. 'apple'	**trái**	**chuối pom**	apple banana	**banane pomme**
cf. 'cavendish'	**trái**	**chuối già (SV)**	large (green) banana	**banane-Cavendish**
		chuối tiêu (NV)		
cf. 'ice cream'	**trái**	**chuối sự**	(angled) banana	**banane cv.**
'lady finger' or 'date'	**trái**	**chuối cau (SV)**	lady finger banana	**banane-arec, banane-figue**
		chuối ngự (NV)		
cv.	**trái**	**chuối chà bột**	banana cv.	**banane cv.**
cv.	**trái**	**chuối sắp**	small, cooking banana	**banane cv.**
Musa cf. *balbisiana* Colla.	**trái**	**chuối hột**	seeded banana	**banane farineuse**
	trái	**chuối chát**	stringent banan (green, unripe)	**banane-astringente**
	bông	**'bắp chuối' (SV)**	banana bud / inflorescence	**fleur de banane**
		'hoa chuối' (NV)		
MYRTACEAE				
Psidium guajava L.	**trái**	**ổi**	guava	**goyavier**
Syzigium aromaticum (L.) Merr. & L.M.Perry	**bông**	**đinh hương**	clove	**clous de girofle**
Syzygium samarangense (Blume) Merr. & L.M.Perry	**trái**	**mận**	water apple	**jamerose, pomme de Java**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
NELUMBONACEAE				
Nelumbo nucifera Gaertn.	**củ**	**củ sen**	lotus root	**rhizomes de lotus**
	hột	**hột sen**	lotus seeds	**graines de lotus**
	lá	**lá sen**	lotus leaf	**feuille de lotus**
	ngó	**ngó sen**	lotus shoot	**tige de lotus**
NYMPHAEACEAE				
Nymphaea pubescens Willd.	**bông**	**bông súng**	night lotus	**nénephar**
OXALIDACEAE				
Averrhoa carambola L.	**trái**	**khế**	star fruit, carambola	**carambolier**
Oxalis sp.	**lá**	**me đất**	sorrel	**surelle**
PANDANACEAE				
Pandanus amaryllifolius Roxb.	**lá**	**lá dứa, dứa thơm**	scented pandanus	?
PASSIFLORACEAE				
Passiflora edulis Sims.	**trái**	**chùm bao trứng**	passion fruit	**grenadille**
PEDALIACEAE				
Sesamum orientale L.	**hột**	**mè (SV)**	sesame seeds	**grains de sésame**
		vùng (NV)		
PHYLLANTHACEAE				
Phyllanthus acidus (L.) Skeels	**trái**	**chùm ruột**	otaheite gooseberry	**groseille-étoile**
Sauropus androgynus (L.) Merr.	**rau**	**bồ ngót**	star gooseberry, sweet leaf	?
PIPERACEAE				
Peperomia pellucida (L.) Kunth.	**rau**	**càng cua**	peperomia	**cresson**
Piper betle L.	**lá**	**trầu**	betel leaf	**bétel**
Piper lolot C.DC.	**lá**	**lá lốt**	lolot leaf	**poivre lolot**
Piper nigrum L.	**hột**	**tiêu**	pepper	**poivier**
PLANTAGINACEAE				
Plantago major L.	**lá**	**mã đày**	plantain	**plantain des oiseaux**
POACEAE				
Coix lacryma-jobi L.	**hột**	**bô bô**	Job's tears	**larmes de job**
Cymbopogon citratus (DC) Stapf	**cây**	**sả**	lemon grass	**citronelle**
cf. *Dendrocalamus asper* (Schult. & Schult.f.) Backer ex K.Heyne	**cây**	**măng tre manh tông**	bamboo shoots of rough bamboo	**pousses de bambou**
cf. *Gigantochloa levis* (Blanco) Merr.	**cây**	**măng tre tầu**	bamboo shoots of Smooth-shoot gigantochloa	**pousses de bambou**
Oryza sativa L.	**cây**	**lúa**	paddy rice	**riz**
	hột	**gạo**	rice (dehusked)	

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
POACEAE (cont.)				
Oryza sativa L. var. glutinosa (Lour.) Körn	**cây**	**lúa nếp**	paddy glutinous rice	**riz gluant**
	hột	**gạo nếp**	glutinous rice (dehusked)	
Saccharum officinarum L.	**cây**	**mía**	sugar cane	**canne à sucre**
Triticum aestivum L.	**cây**	**lúa-mì**	wheat	**blé**
Zea mays L.	**trái**	**bắp (SV)**	corn	**Mais, blé d'Amérique**
		ngô (NV)		
POLYGONACEAE				
Persicaria odorata (Lour.) Soják	**rau t**	**rau răm**	Vietnamese mint	**renouée, persicaire du Vietnam**
ROSACEAE				
Fragaria ananassa (Weston) Duchesne	**trái**	**dâu, dâu tây/ Đà Lạt**	strawberry	**frasier**
Malus domestica Borkh.	**trái**	**pom, táo tây**	apple	**pommier**
Pyrus communis L.	**trái**	**lê**	pear	**poirier**
Pyrus pyrifolia (Burmf.) Nakai	**trái**	**lê trung quốc**	Asian pear	**poitier de chine**
RUBIACEAE				
Coffea sp.	**hột**	**cà-phê**	coffee	**café**
Morinda citrifolia L.	**trái**	**nhàu**	Indian mulberry	**motinde**
Paederia scandens (Lour.) Merr.	**lá**	**lá mơ/thui đít**	Chinese fever vine	**danaide fétide**
RUTACEAE				
Aegle marmelos (L.) Corrêa	**trái**	**bầu nâu, mấm**	Indian bael fruit	**oranger du Malabar**
Citrofortunella microcarpa (Bunge) Wijnands	**trái**	**tắc**	kimquat	**calamondin**
Citrus hystrix DC.	**lá**	**lá chanh**	kaffir lime (leaves)	**limettier hérissé**
Citrus maxima (Burm. ex Rumph.) Merr.	**trái**	**bưởi**	pomelo	**pamplemousse**
Citrus reticulata Blanco	**trái**	**quít xiêm**	tangerine (Thailand cv.)	**mandarinier**
Citrus sinensis (L.) Osbeck	**trái**	**cam**	sweet orange	**oranger**
Citrus X *nobilis* Lour.	**trái**	**cam sành**	king orange	**roi-de-siam**
Citrus X *aurantiifolia* (Christm.) Swingle	**trái**	**chanh ta**	lime	**limettier**
Citrus X *limon* (L.) Burm.f.	**trái**	**chanh tây**	lemon	**citron**
SAPINDACEAE				
Dimocarpus longan Lour.	**trái**	**nhãn (-tiêu/ dabò)**	longan 'pepper seed' / 'cow skin'	**longanier**
Litchi chinensis Sonn.	**trái**	**vải**	litchi	**litchi**
Nephelium lappaceum L.	**trái**	**chôm chôm**	rambutan	**litchi chevelu**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
SAPOTACEAE				
Chrysophyllum cainito L.	**trái**	**vú sữa**	star apple	**cainitier**
Manilkaria zapota (L.) P. Royen	**trái**	**xa bô chê**	sapotillo	**sapotillier**
Pouteria campechiana (Kunth) Baehni	**trái**	**trái trứng gà**	egg fruit, canistel	**jaune d'oeuf, canistel**
SAURURACEAE				
Houttuynia cordata Thunb.	**rau t**	**'giấp cá'**	lizard's tail herb, fish mint	**houttuynie**
SCHISANDRACEAE				
Illicium verum Hook.f.	**bông**	**đai hồi thật, mác hồi** **bong phở (Hl)**	Chinese star anise	**anis étoilée anis de la Chine**
SCROPHULARIACEAE				
Bacopa monnieri (L.) Wettst.	**rau**	**rau đắng**	water hyssop	**bacopa de monnier**
Limnophila chinensis subsp. *aromatica* (Lam.) T.Yamaz.	**rau t**	**'ngò om', 'rau om'**	rice paddy herb	?
SOLANACEAE				
Capsicum annuum var. *grossum* (L.) Sendtn.	**trái**	**ớt ngọt/Đà Lạt**	sweet peppers	**poivre rouge/vert**
Capsicum annuum cf. *longum* Bailey / cf. *frutescens* (L.) Kuntze	**trái**	**ớt**	chili peppers, bird chili peppers	**piment, des oiseax**
Lycium chinensis Miller	**cây**	**câu khởi/ky**	matrimony vine	**lyciet**
Lycopersicon esculentum Miller	**trái**	**cà chua/tô mách**	tomato	**tomate**
Solanum melongena var. *esculentum* (Dunal) Nees	**trái**	**cà dái dê, cà tím**	eggplant (purple)	**aubergine**
Solanum cf. *torvum* Sw. / cf. *undatum* Jacq.	**trái**	**cà pháo**	Thai or pea eggplant	**aubergine - sauvage d'Asie / pois**
Solanum tuberosum L.	**củ**	**khoai tây/Đà lật**	white potato, red potato	**pomme de terre**
THEACEAE				
Camelia sinensis (L.) Kuntze	**lá**	**trà (xanh) (SV)** **ché (NV)**	tea (green)	**théier**
VITACEAE				
Vitis sp.	**trái**	**nho**	(dessert) grapes	**vigne**
ZINGIBERACEAE				
Alpinia galanga (L.) Willd.	**củ**	**riềng nếp**	galangal (larger)	**galanga (grand)**
Alpinia officinarum Hance	**củ**	**riềng**	galanga	**galanga (petit)**
Curcuma longa L.	**củ**	**nghệ**	turmeric	**safron des Indes**
Zingiber officinale Roscoe	**củ**	**gừng**	ginger	**gingembre**

TAXON[a]	Form[b]	Vietnamese[c]	English[d]	French
FUNGI				
AURICULARIACEAE				
Auricularia auricula-judae (Fr.) J.Schröt	**nấm**	**nấm mèo (SV)** **mộc nhĩ (NV)**	tree-ear fungus	**oreille de Juda**
PLEUROTACEAE				
Lentinus edodes (Berk.) Sing.	**nấm**	**nấm đông cô**	shitake mushroom	**lentin du Japon**
PLUTEACEAE				
Volvariella volvacea (Bulliard-Fries) Sing.	**nấm**	**nấm rơm**	straw mushroom	**volvaire**

[a] The same species is used in a different form and/or with a different vernacular name. “cv.” or “cvs.” = a different cultivar of that species. “Gr.” = Group. This term is applied to names of cultivars.

[b]Plant form or structure utilized, or type of use, and the generic rank of the Vietnamese vernacular name. For example, Limnocharis flava, has the form rau and the specific name keo neo. The Vietnamese binomial is then rau keo neo, but the plant can be referred to by only the specific keo neo. Where form and Vietnamese name must be used together to refer to the plant, the form name is repeated in the Vietnamese name listing (e.g., form: bông, Vietnamese: bông hành, must be used together to mean onion flowers). See Appendix B for explanation of form terms.

[c]Vernacular name differences by region denote by: “NV” = northern Vietnam, “SV” = southern Vietnam, “HI” = Hawai‘i. Names surrounded by ‘single quotes’ are used as is without attachment of a form term. Names appearing with a slash ‘/’ = either names occur with first name (e.g., **cần nước/ta** = plant is called cần nước or cần ta).

[d]“ - ” = no English or French name found in the references used.