Community-Led Ethnobotanical Triage: Case study—Myaamia corn traditions

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Research

Abstract

Rapid loss of indigenous ethnobotanical traditions has created a need to triage research efforts to preserve this traditional knowledge. A triage process, however, is best led by those who understand the cultural context of historical data and are keenly aware of the community's pressing needs—the indigenous community itself. Non-community researchers can be involved by lending research skills and connections towards the community-established research goals. This study described a process by which two non-indigenous community researchers supported an indigenous, Myaamia (Miami) research scholar in triaging Myaamia ethnobotanical research priorities and in conducting a focused study on the highest priority plant according to that community: corn (*Zea mays* L.). Data gathered regarding Myaamia corn traditions allowed the reconstruction of the traditional corn cultivation cycle. Description of traditional corn processing techniques, recipes, and identifying traditional corn varieties is helping the Myaamia community in their efforts to preserve cultural historical knowledge associated with planting of corn and in so doing revitalize Myaamia language and culture.

Introduction

Community-led triage

Traditional botanical knowledge is being lost at an alarming rate as indicated by the loss of indigenous language systems that embody and express botanical knowledge of native peoples (Hale *et al*. 1992, Hinton 2001a). Forced removal from and restricted access to ancestral lands limits traditional plant harvesting and contributes to the loss of plant knowledge and associated language (Hinton 2001a). Loss of a place to practice traditions, ceremonies, and native skills, including those related to traditional botanical knowledge, can be extremely detrimental to cultural revitalization and has created a critical need to triage ethnobotanical research efforts. Through triage, available resources, including research assistance, can be assigned to the most pressing community concerns first (Hinton 2001b).

Historically, ethnobotanical research agendas have been developed without significant input from indigenous communities. Too often, research questions, methods, analyses, and conclusions are formulated in an academic vacuum, outside the indigenous community, and yield findings that are interesting but not urgently needed. Triaging an indigenous community's ethnobotanical needs requires intimate knowledge of community values, traditions, resources, and long-term goals—knowledge only the community itself holds. We suggest ethnobotanical research agendas be locally determined and guided by indigenous communities themselves. In fact, a number of ethnobotanical revitalization projects have yielded success with this approach including preservation of ethnobotanical language

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(e.g., Ashininabeg Ethnobotanical Dictionary), revival of traditional land relationships (e.g., White Earth Land Recovery Project, etc.), and teaching traditional plant technologies (e.g., California Indian Basketweavers Association). We posit that the success of cultural revitalization efforts depends upon the community itself initiating the research effort (Hinton 2001a).

Role of outside academic

In community-led ethnobotany the role of the academic outsider is that of an advisor rather than investigator. He/she advises on scientific protocols, species taxonomies, methodological approaches, and research using academic sources. He/she can also network with other academics, fundraise for research needs, and assist in packaging research results into an accessible form that is useful to the indigenous community. Ethnobotanical researchers wishing to study indigenous cultures can approach the community in a new way, with a unique, academic skill set to offer, and in response, the community can review its own priorities and goals and determine if there is a natural "fit" for the researcher to assist them in furthering community goals.

Prior to the initiation of this study, the Myaamia (also known as "Miami") indigenous community of the lower Great Lakes region, eastern Kansas, and northeastern Oklahoma in the United States of America triaged its own research priorities, based on traditional Myaamia values and extensive community input (Baldwin & Olds 2007). The resulting triage set community improvement projects as top priorities, including (1) increasing communally-owned landscapes, (2) improving community member health through promotion of traditional foods, and (3) promoting language revitalization through practice of traditional agriculture. This study focused on the third priority, through an investigation of the traditional plant uses of the Myaamia, with an emphasis on traditional corn cultivation. Because the specific skills needed for such a study were not available within the community, Daryl Baldwin, a Myaamia community scholar and Director of the Myaamia Center for language and culture research, actively solicited non-community academics to help in this ethnobotanical project. From this search, two academics, authors M. Gonella and A. Greenberg, with botanical and anthropological skills, respectively, were recruited.

Methods

Contemporary interviews followed traditional protocols

A traditional Myaamia protocol of holding meetings with "outsiders" using a community liaison was followed in order to complete contemporary elder interviews with Tribal Elders. Serving as our liaison, D. Baldwin invited and accompanied M. Gonella and A. Greenberg to numerous community events and meetings for approximately six months before being thoughtfully guided to initiate ethnobotanical interviews. Following the introductory period we interviewed Myaamia elders and reviewed previously recorded interviews, to collect data regarding contemporary corn traditions. We conducted individual and group contextual interviews using elicitation tools such as voucher specimens, slides, cultural artifact photographs, and plant collecting field trips (Martin 1995). Participant observation of both semi-structured and structured interviews, held primarily at communal gatherings and cultural events, were also used (Schensul *et al*. 1999, Seymour-Smith 1986). A triangulation technique of data verification was employed where possible and single data sources were made clear when used.

Study site

Due to the U.S. government's forced relocation policy during the 1830s and 1840s, Myaamia lands currently include three geographically disjunct landscapes, traditionally referred to by the rivers central to those landscapes. These include lands on the Wabash River, Indiana (before A.D. 1650 to present), the Marais des Cygnes River, Kansas (from A.D. 1846 to present), and the Neosho River, Oklahoma, (from A.D. 1873 to present) (Figure 1). Myaamia community members in all three locations participated in this study.

Study species

Questions regarding the arrival of corn to the Myaamia and corn origins in general were determined irrelevant by the community regarding cultural revitalization and thus, were not explored in this study. In fact, it was determined these questions could have negative, colonial connotations (i.e., "discovering" a single locale of corn origin and possibly staking claim to information or genetic ownership) which could further disempower the Myaamia people. Herbarium specimens of corn (*Zea mays* L.) and seeds of Myaamia white corn were stored at the Miami Nation of Oklahoma's Archives in Miami, Oklahoma.

Myaamia-led triage of traditional plant knowledge

In collaboration with Daryl Baldwin, director of the Myaamia Center, we generated a comprehensive list of traditional plants from historic language documents (Dunn ca. 1900, 1909, 1919, Gatschet ca. 1895, Trowbridge 1938) and previously recorded interviews with elders (Baldwin 1997, Olds *et al*. 1999). We then prioritized the plants on which to focus this study based on the following protocol:

1. Living Knowledge: harvesting or processing knowledge well known within the community.
2. Language Information: plants have Myaamia language terms by scholars or community members.

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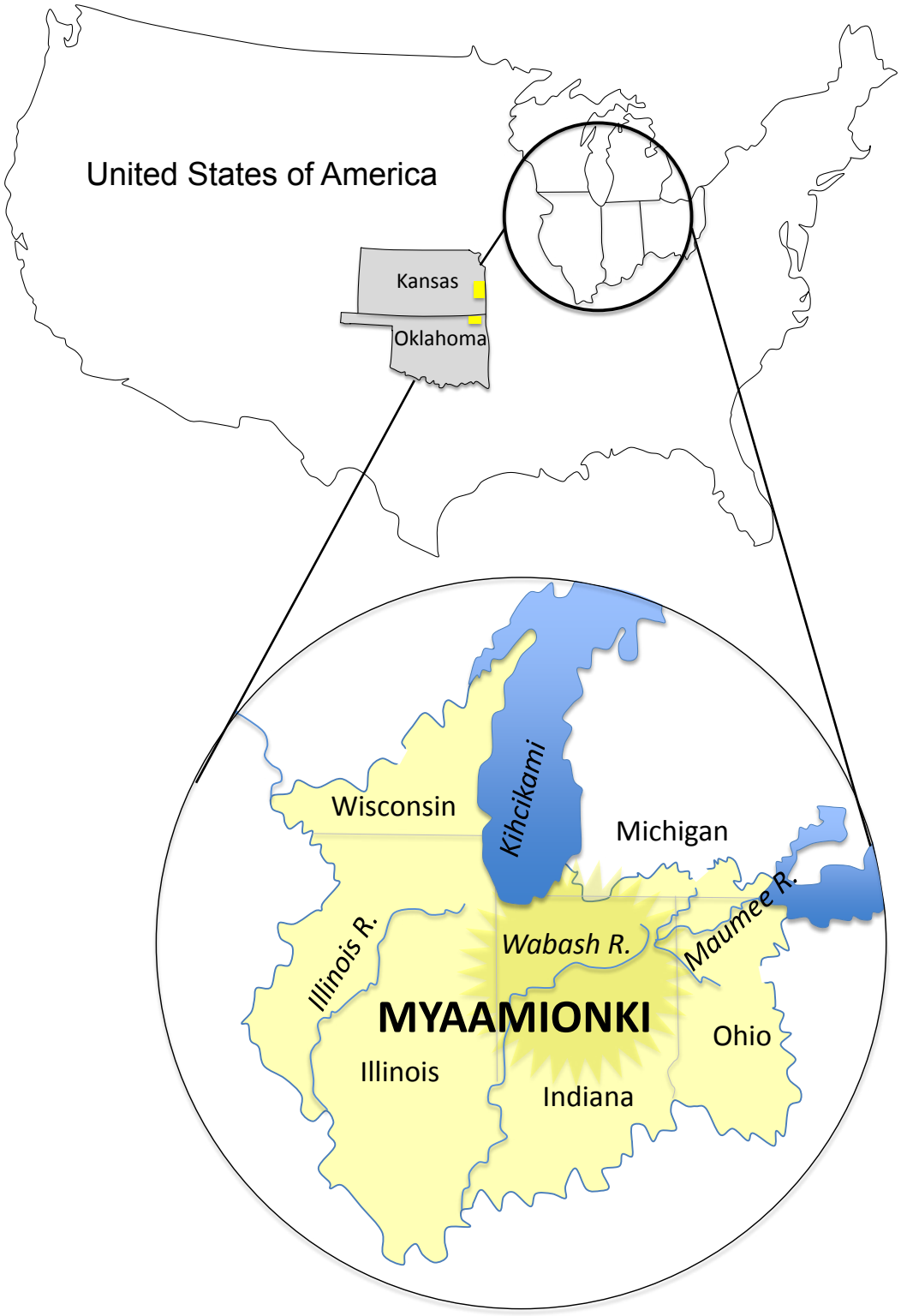

Figure 1. Myaamionki (Myaamia ancestral lands) in the Lower Great Lakes area of the U.S.A. Myaamionki was centralized in northern Indiana, around the Wabash River watershed, with intercultural land-sharing increasing as they moved away from this "core" cultural area. Pre-relocation lands on the Wabash River, Indiana (before A.D. 1650 to present), the Marais des Cygnes River, Kansas (from A.D. 1846 to present), and the Neosho River, Oklahoma (from A.D. 1873 to present). Map after Governanti (2004).

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3. Ease of Access: plant species abundant and readily available on tribal properties
4. Health Benefits: plant(s) with potential health benefits to community members

This final step in the triage was an iterative process involving oral interviews with community elders, community scholars, and non-community scholars in an effort to identify the top three plant species in which to focus this first Myaamia ethnobotanical study.

The top three plants that emerged during this triage are as follows: (1) **miincipi** (corn, *Z. mays*), (2) **leninši** (common milkweed, *Asclepias syriaca* L.), and (3) **ahsapa** (dogbane, *Apocynum cannabinum* L.). Of these three, corn was chosen as the highest priority plant due to existing traditional knowledge, both historical and contemporary. Our research goals are to gather and synthesize historic outsider's observations of Myaamia corn traditions; capture the community voice by documenting contemporary oral knowledge; and finally to disseminate findings to community members.

Collection of traditional corn data

To gather extant Myaamia traditional corn information, we examined two basic data sources: (1) historical writings written by outside observers of Myaamia culture, and (2) contemporary elder interviews recorded during the recent past (within the last 50 years), including interviews conducted by the authors. Historical writings included published and unpublished accounts from explorers, fur traders, and missionaries in the early European-contact period (1650–1750) and a few ethnographic works recorded by linguists in the 19th and early 20th centuries. Aside from these linguistic works and a few more recent studies (e.g., Anson 1970, Rafert 1992), very little specific information has been published on Myaamia ethnobotany. Therefore most historic data were gleaned from unpublished primary-source materials. One such source was the writing of Father Pierre-Francois Pinet whose Myaamia dictionary/word lists were discovered only 20 years ago and have since been translated. We combined historical and contemporary data in the results to assemble as complete a description of Myaamia corn traditions as possible. Historical and contemporary data sources are shown in Table 1.

Using the aforementioned culturally-based protocols as methods, we synthesized contemporary oral interviews and historical interpretations to create a document that supported cultural revitalization and served the following goals: (1) reconstruction of the traditional corn cultivation cycle; (2) describe and define traditional corn processing techniques and recipes; and (3) describing historical and contemporary traditional corn varieties cultivated by Myaamia people.

Results

Fifteen Myaamia elders were interviewed, from 2002 to 2010, ranging in ages from 17 to 93. Seven previously re-

Table 1. Summary of primary historic sources on Myaamia (Miami) corn cultivation.

Observer (Editor/Translator)	Date of Record	Content of account
Nicholas Perrot (Blair 1911)	1680–1718	Encounters with Miami-Illinois
Father Jacques Marquette (Thwaites 1900)	1674–1675	Journal on missions
Louis Joliet (Thwaites 1903)	1674–1677	Voyage to Illinois country
Louis Hennepin (Thwaites 1903)	1674–1677	Description of Illinois country
Father Claude Jean Allouez (Kenton 1925)	1676–1677	Voyage in Miami-Illinois country
Christian LeClercq (Shea 1903)	1679–1680	La Salle's exploration of Mississippi River
Pierre-F.-Xavier Charlevoix (Kellogg 1923)	1682–1761	Voyage through Miami-Illinois country
Anastasius Douay (Kenton 1925)	1687	La Salle's ascension of Mississippi River
Pierre-Francois Pinet (Costa 2004)	1696–ca.1700	Manuscript of Miami-Illinois words
Father Jacques Gravier (attributed)	ca. 1700	Illinois-French Dictionary
Pierre-Charles Deliette (Pease 1934)	1702	Memoir concerning Illinois country
Henri Joutel	1714	Voyage to Illinois River with La Salle
Jean-Baptiste Antoine-Robert LeBoullenger	ca. 1719–1744	French and Miami-Illinois dictionary
Charles C. Trowbridge	1825	Meearmeear [Miami] traditions
John B. Dillon	1859	Ethnohistoric publication on Indiana
Albert S. Gatschet	ca. 1895	Manuscripts regarding the Miami
Jacob P. Dunn	ca. 1900, 1919	Interviews with Miami Indians

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corded interviews, from 1968 to 1999, were also reviewed to collect data regarding contemporary corn traditions.

Traditional corn cultivation cycle

Like many land-based cultures, the Myaamia corn cultivation cycle was closely tied to seasonal changes in temperature, precipitation, and life cycles of plants and animals. Myaamia agricultural practices were tied to ecological cycles and triggered by phenological and other ecological indicators. We used the Myaamia lunar calendar to contextualize seasonal corn and other agricultural activities (Dunn 1909). Four main historic sources were used to reconstruct the seasonal, traditional Myaamia corn cultivation cycle (Figure 2) (Deliette (1934 [1702], Hennepin 1903 [1698], Joliet 1903 [1698], Trowbridge 1938 [1825]), while other primary sources added additional details (Allouez 1903 [1676–1677]; Anonymous 1902 [1746], Charlevoix 1923 [1682–1761], Gravier 2002–2006 [ca. 1700], Marquette 1925 [1674], Perrot 1911 [1680–1718], Pinet 2004 [1696–ca. 1700]) (Table 2).

Cecaahkwa kiilhswa: Sandhill Crane Moon (~April)
In early spring, the arrival of sandhill cranes (*Grus canadensis* L., 1758) migrating north was one of many ecological cues signaling to the Myaamia the beginning of summer and a return from hunting to summer villages often near rivers. Preparation for corn cultivation involving firewood gathering began at this time so come planting time in May, there would be no interruptions (Deliette (1934 [1702]). Hunting bison (*Bison bison* L., 1758) was delayed until directly after corn planting (Joliet 1903 [1698]).

Wiihkoowia kiilhswa: Whipporwill Moon (~May)
The whippoorwill's call in early spring signaled the time to begin corn cultivation ending early June after fields were sown (Deliette 1934 [1702], Gatschet ca. 1895). As soon as the corn was planted, the village embarked on a bison or deer hunt for several weeks. The corn fields were generally under the control of the women who oversaw the cultivation, planting, hilling-up, tending, and protecting of the corn fields as well as the distribution and preparation of corn (and all other) foods (Deliette 1934 [1702], Joliet

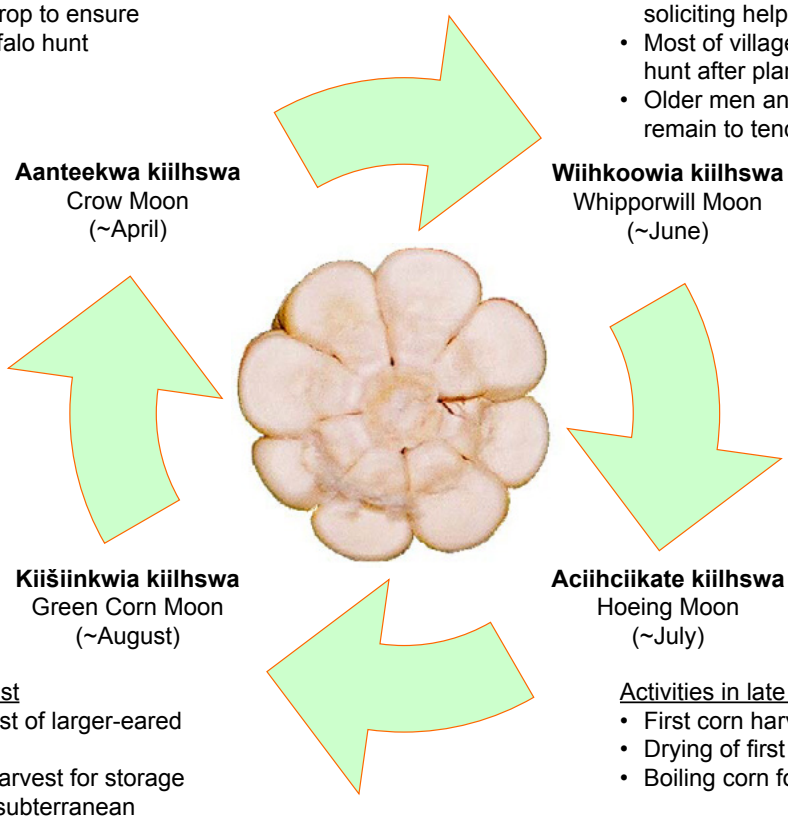

Figure 2. Myaamia seasonal cycles of corn cultivation and hunting following the Myaamia lunar calendar (Miami moon terms from Costa 2006, Dunn 1900).

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Table 2. Myaamia corn cultivation terms and phrases (Baldwin & Costa 2005, Dunn ca. 1900, Gravier ca. 1700, Masthay 2002, Pinet 1696–ca.1700). Phonemicization (spelling of the sound) still unclear on blue terms.

Myaamia terms & phrases	English translation (literal)
miincipahki	corn field
nipapakitan	I scatter the seed corn
nintansiwatoo	I plant/seed it
anaahkapi noontiohseewi	the ears of corn appear, or sprout
niwiitapintaan miincipi	I stand guard over the corn
wiiliteewi	the ear of corn already has silk
maleewiniikinwi	it is not growing, not ripe; grows badly
aalwiniikinki	it fails to grow
pikinikinsin8i	it is not growing, not ripe
kieskinepinamani	break corn husk to make it ripen
kiišiinkweewimini	ripened corn (milk stage)
kaalahsakiinkwee-wala	ripe ear of corn or flint corn
nimiincipehkii	I go to pick corn
ninatchimintchipa	I go to pick corn

1903 [1698], Trowbridge 1938 [1825]). Prior to disruption by settlers and relocation, corn was often planted on the floodplains of nearby rivers including the Wabash, Eel, and Missessinewa rivers in northern Indiana, the White River of central Indiana, the Maumee and Auglaize rivers of northern Indiana and Ohio, and the mouth of the Ohio in southern Illinois (Anonymous 1902 [1746], Dillon 1859 [1817], Pinet 2004 [1696–ca. 1700]). The Myaamia presumably placed these fields along rivers to capitalize on the moist, fertile floodplain soils. The proximity of summer villages to the prairie/woodland transitional ecotone allowed for both agriculture in the prairies and deer hunting in the adjacent woodlands.

Paaphsaahka niipinwiki: Mid-summer (~June)
This moon falls around the summer solstice. At the end of July women communally harvested then dried the first corn. Historically, corn was cleaned off the cobs with sharp shells, immediately dried for storage, then roasted or boiled later (Deliette 1934 [1702], Dunn ca. 1900, Gravier 2002–2006 [ca. 1700]).

Kiišiinkwia kiilhswa: Green Corn Moon (~July)
The first harvest was at the beginning of August. The corn was husked, spread on cattail or bulrush mats, dried for a week, and threshed using large wooden sticks (Deliette 1934 [1702]). Dried kernels were stored in underground holes or caches lined with bark or in large woven baskets or gourds (Charlevoix 1923 [1682–1761], Hennepin 1903 [1698], LeClercq 1903 [1679–1680], Marquette 1925 [1674]). Corn was stored for eating in the fall and winter and as seed corn for the following spring (Hennepin 1903 [1698]). This was also the time of the green corn harvest, where corn in the milk stage (mature, but not dry) was harvested for immediate use as food. Charlevoix described Myaamia corn harvesting celebrations which would take place during this time (1923 [1682–1761]). A lower jaw bone of a deer was the traditional tool used for scraping freshly husked corn kernels to obtain the green corn juice which was dried or baked. At this time the Myaamia made forays into the prairie to hunt bison, returning to the summer village site for assistance in harvesting, processing, and storage of corn and meat (Dunn 1909, Esarey 1997).

Mihšiiwia kiilhswa: Elk Moon (~August)
During the final two months of summer the Myaamia harvested corn planted from 2nd and 3rd plantings (Joliet 1903 [1698], Marquette 1925 [1674]).

Šaašaahkaayolia kiilhswa: Grass Burning Moon (~September)
After all harvests, summer villages were left for winter hunting regions (Esarey 1997); about six lunar cycles were involved in corn cultivation during historic times, constituting the “summer moons” of the Myaamia lunar calendar system.

Aside from historic outsiders’ observations of Myaamia corn cultivation (above), several contemporary Myaamia elders commented on traditional corn cultivation practices including the special role of women in this tradition:

> Women are the keepers of the corn seeds and pass them on to their daughters. When planting we put the seeds in our mouth first to moisten them and to give them a little life before planting.

> Both men and women helped in corn cultivation, the men helping to clear the fields by pulling out large tree stumps. But the women did the planting and tending of corn.

> She (my step-mother) brought the flour corn that she called Aunt Mariah’s corn [Myaamia white corn, from Indiana to Kansas] . . . and she just saved everything from year to year, you know.

Corn seeds were planted into hills, and in some families a fish was placed under the base of the hill for fertilization (Deliette 1934 [1702], Carlson 1996, Himes 1966, Rafert 1989). One elder described how the seeds were held in the mouth and hydrated by saliva before planting. Both men and women participate in corn cultivation, but in different ways. Men helped prepare the field by removing trees and stumps while women planted and tended the

growing crop (Baldwin 1997, Deliette 1934 [1702], Joliet 1903 [1698]).

Traditional corn processing and recipes

Pinet's lists (2004 [1696–ca. 1700]) of Myaamia corn terms also included terms for corn processing and cooking (Table 3), including a recipe using Myaamia white corn only. Of all records, dried green corn ranked highest in frequency, followed by corn boiled then seasoned with animal fat, also called corn soup, and corn meal (Figure 3). In general, corn was traditionally cooked with meat and meat fat or with vegetables like wild pumpkins or cultivated squash (Deliette 1934 [1702], Marquette 1925 [1674], Perrot 1911 [1680–1718]). For example, Father Marquette was served a dish called **sagamite** upon his first visit to the Myaamia people in 1674 and described it as a thick mixture of boiled corn and animal fat (Marquette 1674, from Kenton 1925:349). In addition, both Charlevoix and Marquette encountered Myaamia corn bread, and Charlevoix recorded the ingredients to include kneaded corn meal, beans, fruits, and animal fat (Marquette 1674, from Kenton 1925:363, Charlevoix 1923 [1682–1761]).

Past as well as present corn traditions were widely recognized by contemporary elders, most often by women (Carlson 1996b, Deliette 1934 [1702], Himes 1966, Rafert 1989). Corn drying, grinding and cooking for hominy, and cracked corn soup were three commonly recalled processes:

> To dry the corn we first husked it, washed, then cut the kernels off the cob and spread it out on cheesecloth. Then we placed it outside on flat surfaces, like a metal roof. Drying was my family's favorite way of storing. Once dried, we stored it in bags.

> In the old days, corn was ground into meal in a wooden mortar and pestle made from a hollowed out log, by my great grandmother, whose wooden grinding bowl I still have. Now we grind corn using a mechanical grinder after drying.

Processing of corn for hominy was also a commonly recalled process:

> Hardwoods made better lye-ash. We'd fill the tub with water and add ashes. Let the ashes settle down, poured water off to soak corn in, then added corn. Then we'd let sit until husks were soft, soaking

Table 3. Myaamia corn processing and cooking terms and phrases (Baldwin & Costa 2005, Dunn ca. 1900, Gravier ca. 1700, Masthay 2002, Pinet 1696–ca.1700). Phonemicization (spelling of the sound) still unclear on blue terms.

Myaamia terms & phrases	English translation (literal)
mahtohkatwi	cracked corn, cooked cracked hominy
mahtohkatoopowi	cracked corn soup
kitahsaakani	parched corn
noolintia	hominy corn, ready to eat or store, lye hominy
palakiinkweesaakani	hominy from heated lye process
peelakiinkweehaminki	uncooked crack hominy
peenkiteeki miincipi	popcorn (corn that explodes by heat)
miincipikaani	corn crib for storage
nikakap8e	I roast an ear of corn
nimaawatenaan	I gather the corn, make a corn pile
nimpahsakiinkweesaan	I soak (the corn) in lye
nimpoohkaanaan	I sift/winnow it

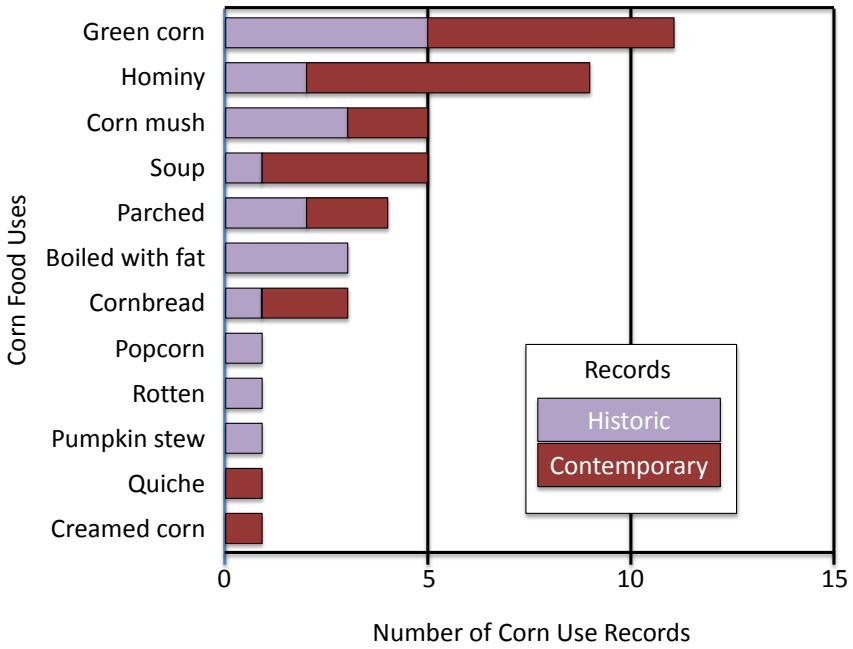

Figure 3. Number of ethnobotanical records of traditional Myaamia corn recipes.

> for a long time, maybe overnight or two nights. Rinse a number of times. I remember this because we [kids] had to draw the water for rinses. When it was done, it was hominy, and we canned it. We never used heat, just soaked it in cold water.

Another elder mentioned the role of corn soup as a feast food, for special events and life-passage markers (i.e., death, birth, birthday).

> It's prepared without any seasoning, no salt in feast food. Normally, feast foods are traditional dishes, like pot meat, corn soup, hominy . . . Corn soup is made with dried corn and pork, salt, and a tiny bit of sugar.

At a contemporary community gathering a number of traditional corn recipes were made including parched corn (Figure 4), corn and walnut soup (Figure 5), hominy (Figure 6), and corn and meat soup (Figure 7) (detailed recipes found in Appendix 1).

Table 4. Myaamia corn variety terms and phrases (Baldwin & Costa 2005, Dunn ca. 1909, Gravier ca. 1700, Masthay 2002, Pinet 1696–ca.1700).

Myaamia terms & phrases	English translation (literal)
keetakiinkweeki	many colored corn (spotted corn)
oonsaawiinkweemini	yellow corn
waapiinkweemini	white corn
iihkipakiinkweemini	blue corn
neehpikiinkweeki	red corn
waahkamiinkweeki	clear corn
kiišiinkwia	green corn
mahkateeyaankweewi	black corn

Figure 4. Myaamia parched corn.

Figure 5. Myaamia corn and walnut soup.

Figure 6. Myaamia hominy.

Figure 7. Myaamia corn and meat soup.

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Traditional corn varieties

Historical language documents yielded several color terms associated with corn (Table 4), suggesting several distinct corn varieties historically cultivated (Baldwin & Costa 2005, Dunn ca. 1900, Gravier 2002–2006 [ca. 1700], Masthay 2002, Pinet 2004 [1696–ca.1700]). Myaamia white corn (Figure 8) was the most common variety of corn described in cultivation historically—its use first recorded in 1702 as a variety unique to the Myaamia culture, and again in the 18th 19th and 20th centuries (Charlevoix 1923 [1682–1761], Deliette (1934 [1702]), Dunn ca. 1900, 1909, 1919, Gatschet ca. 1895).

The uniqueness and importance of Myaamia white corn to contemporary Myaamia culture was supported in interviews where elders described in detail its physical characteristics to include a stalk bearing deep, red roots, long, thin ears with red silks, and eight to ten rows of whitish kernels (Olds 2000, Rafert 1989). Elders also described specific methods to maintain strain purity and family stories of hand-carrying seeds during forced relocation (Olds *et al*. 1999, Olds 2002). Elders described Myaamia white corn as a flour corn for grinding into flour or meal, or for parching, cracking, or cooking whole to make hominy—always involving some type of processing before consumption.

Discussion

The results of this community-led study, focusing on corn as directed by the Myaamia's triage of community needs, was of direct and immediate use to current cultural revitalization work. The resulting three syntheses describing the traditional corn cultivation cycle, corn processing and cooking recipes, and traditional corn varieties unified otherwise fragmented data into a culturally meaningful and

Figure 8. Myaamia white corn.

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Figure 9. Miami Nation of Oklahoma's children's camp, **eewaansapita,** activities involving corn planting and traditions.

useful whole. The corn processing techniques are being used for comparative purposes for those community members already cooking corn dishes and those wishing to begin learning traditional cooking techniques. The compilation of corn variety data also served a practical purpose, establishing an inventory of traditional cultivars from which current community members could choose when planting. Most community members do not have the time to research and synthesize all the extant data on Myaamia corn cultivation, thus the three syntheses proved highly valuable in making this information accessible, as well as creating a holistic framework from which new cultural traditions can evolve.

Those interpretations that were accepted are presented here and represent the voice of the contemporary Myaamia community. Our melding of the historical and contemporary data directly benefited the Myaamia community by helping to preserve traditional lifeways, stabilize traditional culture, and enhance revitalization efforts (Berkes 2003).

Traditional corn cultivation renewal

The reassembled corn cultivation cycle is directly serving the community in their efforts towards revitalization of traditional agriculture. Community members are beginning to use findings from this study to revive historic corn cultivation methods on communal and private lands, as well as further evolution of contemporary cultivation methods. Both avenues of cultivation strengthen Myaamia community ties and reinforce community identity.

A return to more traditional cultivation methods described here, closely tied to the natural, seasonal availability of resources, will help conserve soils and water on community lands. The Miami Nation of Oklahoma's children's camp, **eewaansapita,** is now using some of these results to augment their activities involving corn planting and tra-

Figure 10. Emerging Myaamia communal activities involving multi-generational participants.

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ditions (Figure 9). Another Myaamia communal activities are emerging, involving multi-generational participants, as in the past (Figure 10). Effects of revitalizing traditional practices like corn cultivation are far reaching, serving Myaamia youth as rites of passage, self-esteem builders, and identity reinforcers, as is the case for many North American Indian youths (Wilson 2005).

Traditional corn processing and recipes

New Myaamia family gatherings focusing on cooking traditional recipes are an important result of this research. A spirit of cultural knowledge exchange was created at such gatherings, where recipes were compared between families, old recipes were tried out for the first time in decades, and in some cases new innovations on old recipes were attempted. A byproduct of these gatherings is the initiation of a traditional Myaamia recipe cookbook.

A comparison of historic to contemporary corn recipes was made possible through this study as well. Some contemporary recipes were found to be quite similar to historic ones, possibly indicating current traditions being rooted in the ways of Myaamia ancestors. For example, Marquette's (1925 [1674]) descriptions of Myaamia **sagamite** and corn bread may be the culinary predecessors for contemporary recipes recalled by one elder (Carlson 1996b). The similarity between contemporary and historic corn processing techniques is remarkable in this case, especially considering the high degree of cultural disruption over the last three centuries.

Traditional corn varieties

This study verified that Myaamia white corn was a staple crop for the Myaamia community over the last 300 years—this knowledge renewed interest in its cultivation and seed dissemination. An expanded search for other corn varieties traditionally cultivated has begun, creation of a community seed bank is underway, and there is increased communication with neighboring tribes regarding corn varieties cultivated. Also, this study spurred a comparative genetic study of the Myaamia white corn landrace to learn more about its relationship to neighboring varieties (Long 2010). The genetic study confirmed the uniqueness of this cultivar, which is strengthening it as a symbol of the Myaamia community.

Conclusions

Use of native language is critical to cultural, including agricultural, revitalization. The Pueblo de Cochiti community near the Rio Grande River and native Hawaiians have had much success teaching language *in situ* while actually cultivating traditional crops (Pecos & Blum-Martinez 2001, Wilson & Kamanā 2001). Similarly, in the California's Master-Apprentice Language Learning Program, serving many California native communities, language is taught through immersion in traditional activities, such as tending a traditional garden (Hinton 2001a). Hinton states that without the knowledge of plants, harvesting, and traditional crop cultivation, language and culture evolution cannot be restarted (Hinton 2001c).

Myaamia language terms and phrases related to corn learned in this study were used in classroom and hands-on traditional agriculture workshops. Other corn language and cultivation-related results of this study were disseminated directly to the community via presentations, newsletters, language curricula, including the community's first Myaamia dictionary, and a smartphone application (Baldwin & Costa 2005). This study provided a foundational framework, a digital ethnobotanical database, in which new language and cultural data can be incorporated. For example, the corn terminology list from the manuscript of Pinet, utilized heavily in this study, was only recently discovered in the Jesuit archive at St. Jérôme, Québec (McCafferty 2005). All language terms and cultivation data from this study were transcribed, translated, and added to a database available to Myaamia community members (Costa 2004, 2006).

Selecting traditional corn practices as the most important focus for Myaamia community's current available resources directly and expediently benefitted the contemporary Myaamia community in language and culture revitalization. The three syntheses provided direct value to language efforts, and documentation of elders' comments regarding corn traditions encouraged elders to discuss and recall oral traditions from their childhoods and discuss experiences of their recent ancestors. These discussions raised awareness in the Myaamia community regarding traditional plant usage, renewal of home cultivation of Myaamia corn, and historically-based recipes. In general, results of this community-led research study bolstered Myaamia cultural and language revitalization efforts and thus enhanced the community's strength, resilience, and identity.

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Appendix 1. Traditional Myaamia corn recipes.

Kitahsaakani – Parched Corn

Ingredients
dried corn kernels

Method
1. Using dried corn, remove all the kernels from the cob.
2. Use a cast iron skillet or other heavy metal skillet that will hold heat well. Heat the skillet to medium heat. It is optional to use oil while preparing parched corn. If using oil, use enough to coat the kernels. Do not deep fry.
3. When heated well, add enough corn kernels to cover the bottom of the skillet.
4. Stir the corn continuously in order for them to heat and brown evenly.
5. As the corn begins to turn light brown and puff up, you will start to hear popping sounds. This should be a slow process. Take your time and heat slowly. It is also optional to season with your choice of flavors. This is a good time if you choose to do so.
6. When all the corn is brown and a round shape, remove from heat. Drain on a paper towel to absorb any oil used. Parched corn should be as dry as possible to keep for long periods of time.
7. When cool and dry, store in airtight container for future use or eat immediately.

Miincipi neehi aayoonseeki nipoopi – Corn and Black Walnut Soup

Ingredients
2 cups black walnuts, shelled
2 cups corn
water to cover
1/4 cup onion, chopped (optional)
2 tbsp olive oil

Method
1. Sauté onions in a small amount of olive oil.
2. Put shelled black walnuts and corn in a pan.
3. Add onions to walnut and corn mixture and cover with water.
4. Add two cups additional water.
5. Boil until tender. Add more water if needed.

Servings: 4

*Recipe credit: Dani Tippman, Myaamia Elder

Mahtohkatoopowi – Corn & Meat Soup

Ingredients
1 cup corn, cracked and dried
1 lb. pork cubed or hambone
1 medium onion, diced
salt to taste
pepper to taste

Method
1. Prepare corn
2. Soak corn overnight in enough water to cover corn and above an inch or two.
3. Begin to cook in the morning slowly on stove or in crock pot.
4. When corn is nearly done, chop pork into 1/2 inch cubes and fry in pan with onions.
5. When pork is completely cooked through, add to the corn mixture.
6. Finish cooking all until corn is tender.
7. Add salt and pepper to taste.

Servings: 8

Noolintia – Hominy

Ingredients
dried corn
water
wood ashes

Method
1. Place wood ashes in a large bucket, cover with water and let it sit overnight. The water becomes lye-water.
2. Place dried corn into the bucket. The lye-water loosens the hull from the corn. Leave corn in bucket until the corn swells up.
3. Rinse swollen corn in fresh water several times. Can be used fresh or dry.
4. To dry hominy corn for storage, place in the sun or on low in the oven until swollen kernels are completely dry.
5. To use dried hominy corn, put it in a large pot and add water to cover. Bring to a boil, reduce heat to medium. Cook at a brisk simmer until the hominy opens and is tender, 1 to 1 1/4 hours, adding more water as needed to keep the hominy covered.
6. Use in various recipes, often adding meat, vegetables, and spices and simmering for approximately 30 minutes.

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