‘Dígame usted, si conoce la molienda’ - A photoethnographic essay on traditional sugar-making practices in Santa Mónica, Tianguistengo, Mexico

Daniela Hernández-Pacheco, Anibal Silva Cantalice, Carlos Henrique Tavares Mendes, Francisco Igor Ribeiro Santos, Gabriela González-López, Letícia Zenóbia de Oliveira Campos, Marleny Prada De La Cruz, Taline Cristina da Silva, María Teresa Pulido Silva

Correspondence

Daniela Hernández-Pacheco[1], Anibal Silva Cantalice[2], Carlos Henrique Tavares Mendes[2], Francisco Igor Ribeiro Santos[2,3], Gabriela González-López[1], Letícia Zenóbia de Oliveira Campos[4], Marleny Prada De La Cruz[2], Taline Cristina da Silva [5], María Teresa Pulido Silva [1]*

[1]Laboratorio de Etnobiología, Centro de Investigaciones Biológicas, Instituto de Ciencias Básicas e Ingeniería, Universidad Autónoma del Estado de Hidalgo, Carretera Pachuca - Tulancingo Km. 4.5, s/n, C.P. 42084, Mineral de la Reforma, Hidalgo, México.
[2]Laboratório de Ecologia e Evolução de Sistemas Socioecológicos (LEA), Departamento de Botânica, Universidade Federal de Pernambuco, Av. Prof. Moraes Rego, Cidade Universitária, Recife, Pernambuco 50740-600, Brazil.
[3]Laboratório de Ecologia Vegetal dos Ecossistemas Nordestinos, Centro de Biociências, Departamento de Botânica, Universidade Federal de Pernambuco, 50670-901, Recife, Pernambuco, Brazil.
[4]Centro das Ciências Biológicas e da Saúde, Universidade Federal do Oeste da Bahia, R. da Prainha, n. 1326, Barreiras, Bahia, 47810-047, Brazil.
[5]Laboratório de Etnobiologia e Conservação de Ecossistemas (LAEC), Universidade Estadual de Alagoas, Campus III, Palmeira dos Índios, Alagoas, Brazil

*Corresponding Author: mtpulido@yahoo.com

Ethnobotany Research and Applications 33:72 (2026) - http://dx.doi.org/10.32859/era.33.72.1-15
Manuscript received: 06/02/2026 - Revised manuscript received: 28/03/2026 - Published: 30/03/2026

Research

Abstract

Background: The production of *pilón* from sugarcane is part of the cultural heritage of many communities that preserve their traditions in the artisanal processing of this product. This article aims to document the artisanal *pilón* production process in the rural community of Santa Mónica.

Methods: We conducted participant observation and sequential photographic recording, followed by a categorization of the practices observed. The images were organized chronologically to document and analyze the production process and the local knowledge involved. Accordingly,, this study employed a photo ethnography approach.

Results: The production cycle comprises five stages: (1) sugarcane cultivation and processing, which includes planting, harvest, and transporting the cane to the processing site; (2) cooking and reduction of the juice, in which the cane juice is

boiled in a wood-fired oven; (3) molding and unmolding, involving the use of clay containers, from which the *pilón* is carefully unmolded after a set period; (4) packaging, carried out with local materials such as cane leaves and agave fibers; and (5) commercialization, primarily in regional markets and for household consumption.

Discussion: The artisanal production of *pilón* constitutes a complex technical and social system, grounded in local knowledge, family cooperation, and deep cultural roots. The division of labor follows both practical and symbolic logics, expressing values of reciprocity and collective identity

Conclusions: It is urgent to recognize artisanal *pilón* as Mexico's biocultural heritage and to implement public policies that ensure its appreciation and continuity, highlighting the role of family farmers as key actors in food sustainability.

Keywords: Biocultural heritage; Ethnobiology; Food sovereignty; Milled sugar; Traditional knowledge.

Background

Around 10,000 years ago, sugarcane (*Saccharum* spp.) started to be domesticated and cultivated in New Guinea, from where it was later introduced to other parts of Polynesia, Asia, Indonesia, India, Persia, and Arabia, although the history of its domestication remains poorly understood (Mishra & Agarwal 2024; Denham 2025). The introduction of sugarcane (*Saccharum officinarum* L.) into the Americas in the 15th century was driven by the increasing European colonial demand for sugar, solidifying its role as one of the key economic resources of that period (Mintz 1985; Sentíes-Herrera *et al.* 2017). When brought into Mexico in the 16th century, it transformed regions like the Huasteca Potosina into major sugar production centers, connecting them to the global economy of raw material exports (Aguilar-Rivera 2010).

Initially, European colonizers aimed to produce milled sugar, a semi-refined product similar to modern brown sugar. However, local populations found alternative uses for sugarcane that went beyond commercial interests, leading to derivatives such as *pilón*—the regional term used in the study area—or *piloncillo* and *panela*, as they are known in other parts of Mexico (Jaffé 2012). These products are known by various names worldwide: Asia (*Jaggery; Gur; Muscovado*), Latin America (*Panela; Rapadura; Papelón*), Africa (*Jaggery; Sukari Njumru*) (Jaffé 2012). They offered an alternative to industrial sugar-refining systems (Gutiérrez-Mosquera *et al.* 2018), contrasting with "milled sugar" intended for the global market. Made using traditional techniques of evaporation and crystallization of sugarcane juice, *pilón* has become a symbol of cultural resilience and food sovereignty, especially among rural and Indigenous communities in Mexico (Cazares-García *et al.* 2023). *Pilón* has allowed these communities to maintain not only an economic activity but also a resilient cultural practice (Moreno-Calles *et al.* 2016), which persists today. Although detailed national data on *pilón* production are lacking, estimates indicate that the main producing states—Veracruz, Quintana Roo, Nayarit, Jalisco, San Luis Potosí, Hidalgo, and Colima—collectively produce approximately 60,000 tons annually (FIRCO 2018).

Pilón has various industrial uses, including in the coffee industry, distilled agave drinks, soft drinks, and baked goods, among others (Cuevas *et al.* 2017). It is also used domestically, especially among low-income groups (Martínez & Rivera 2019). From a nutritional standpoint, *pilón* provides benefits over refined sugar because it retains minerals like iron, calcium, and magnesium, and it is not processed with chemicals like bleaching agents (Quezada-Moreno & Gallardo-Aguilar 2014).

Its production is based on smallholder farms, relying on family labor and low mechanization that has not experienced substantial changes much over time (García 2015). The main challenges it faces are: (1) fluctuations in production and sales due to variable harvests (Cortés *et al.* 2013); and (2) declining participation of younger generations, since producers tend to be middle-aged (50 to 57 years old - Cuevas *et al.* 2017). These challenges are linked to low profitability, reliance on intensive manual labor, and competition from industrial agriculture (López *et al.* 2015), all of which threaten the continuation of this tradition. In this context, ethnographic documentation—especially through photo-ethnography—becomes an important tool to preserve and highlight this threatened knowledge (Tiballi & Jorge 2007). Accordingly, this study documents the *pilón* production process in a rural community of Santa Mónica, Municipality of Tianguistengo, Mexico, using visual ethnography to describe the technical steps and traditional knowledge involved.

Materials and Methods

Study area

Santa Mónica is a locality in the Municipality of Tianguistengo, in northern Hidalgo, Mexico (Figure 1) bordering the state of Veracruz, bordered by Ignacio de la Llave to the east and south, covers 18.00 km². It is located at 20°43'44.79" N,

98°39'56.44" W, at an elevation of 1,660 m above sea level. It is bounded to the north by the Chinameca River, to the south by the locality of Tepeoco, to the east by Tianguistengo and Las Cantinas, and to the west by Nonoalco and Malila. The area is part of the Sierra Madre Oriental biogeographic province and the Huastecan Karst sub province, characterized by mountainous and hilly terrain (INEGI 1992).

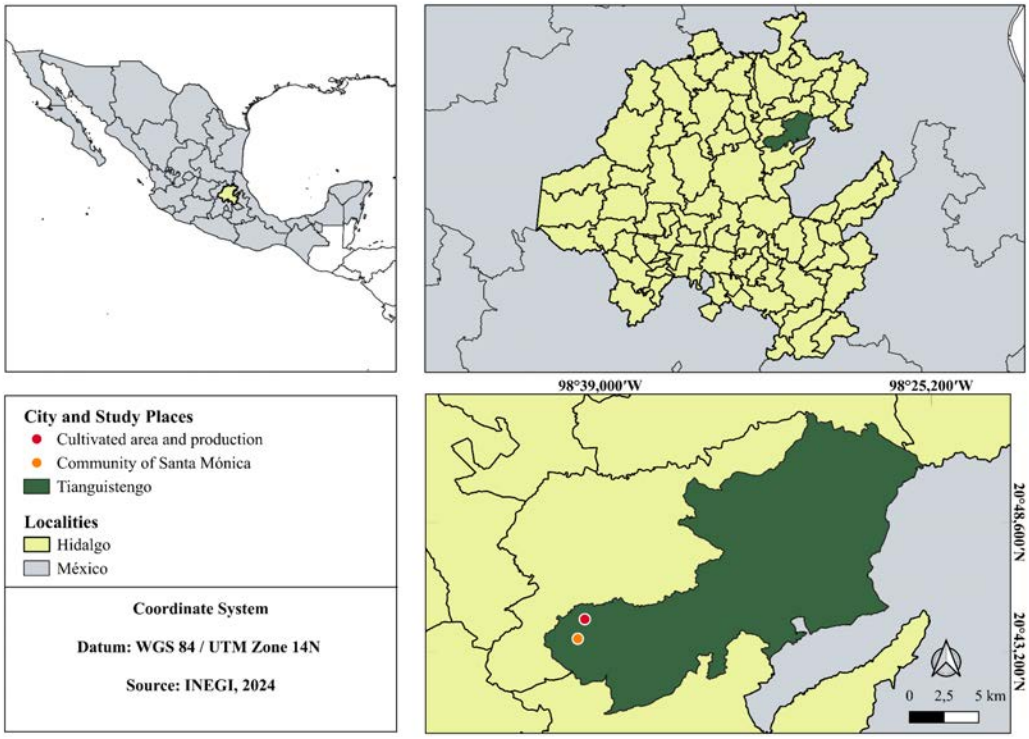

Figure 1. Map of the study area showing the location of the community of Santa Mónica and the area where *pilón* is cultivated and produced, in the Municipality of Tianguistengo, State of Hidalgo, Mexico.

The climate of the region is temperate and humid, with rainfall distributed throughout the year. Temperatures range from 12 °C to 24 °C. The area hosts remarkable biodiversity and is mainly characterized by cloud forest due to high atmospheric conditions humidity, followed by patches of secondary pine-oak forest (INEGI 1992). The predominant soils are luvisols and leptosols, well-drained and geologically composed primarily of limestone and Upper Jurassic shale (Yta *et al.* 1999).

Santa Mónica has a population of 964 residents, comprising 460 men and 504 women (INEGI 2020 A). The community belongs to the Nahua Indigenous group, speakers of the Náhuatl language within the Uto-Nahua linguistic family, with the regional variant called *Mexicano de la Huasteca Hidalguense* (INALI 2008). It is also listed in the Catalogue of Indigenous Peoples and Communities of the National Institute of Indigenous Peoples (INPI 2025). Currently, there are no active speakers remaining (field observation); however, many Náhuatl-derived terms are still used, especially in place names and the vernacular names of animals and plants.

The economic situation of the municipality is characterized by a high level of labor informality. According to the National Survey of Occupation and Employment (ENOE), more than 70% of the employed population in the state of Hidalgo is engaged in informal employment, a pattern that is more pronounced in rural municipalities such as Tianguistengo (INEGI, 2023). Self-employment and non-wage labor predominate, associated with small-scale productive units lacking technification and access to capital, resulting in low and unstable incomes. Labor migration constitutes a complementary economic strategy. At the municipal level, migration is mainly temporary, directed both toward other regions of the country and, to a lesser extent, toward the United States. Remittances provide additional income for some households, although they do not constitute the primary economic base of the local economy (INEGI, 2020 B). Economic activities at Santa Mónica include small-scale (family-based) agriculture, livestock production, garment manufacturing (trousers), and secondary activities such as construction work. There are currently seven *pilón* production units (*molienda*) in Santa Mónica.

Data Collection

Participant observation and visual recording

Fieldwork was carried out on April 14, 2025, with the community's voluntary and informed consent for data collection, following the ethical guidelines of ethnobiological research. Local authorities approved the researchers' access to conduct the study. Specifically, contact was made with a group of individuals involved in *pilón* production, who granted permission to observe them during their productive activities. There are currently seven *pilón* production units in Santa Mónica. The productive unit studied was selected by convenience, as the first author (DHP) has personal ties of friendship with these individuals. This group of *pilón* producers included three family members — a 77-year-old woman, the head of household; her 37-year-old son; and her 25-year-old grandson — along with two additional individuals (60 and 70 years old) who helped in different stages of the process. All were native to Santa Mónica and had been practicing traditional *pilón* production for decades.

To achieve the proposed objectives, we adopted an integrated methodological approach, combining sequential photographic documentation and participant observation to record and analyze the traditional *pilón* production process. These methods are well established in ethnographic and ethnobiological research as tools for deep immersion in local sociocultural contexts and for understanding knowledge and practices embedded in traditional systems (Campos *et al.* 2019). Participant observation allows for direct monitoring of production stages, enabling the researcher to capture the technical, symbolic, and social nuances of the process (Richardson *et al.* 2012). The local vocabulary used by *pilón* producers was compiled into an ethnobotanical lexicon provided at the end of the text.

This approach not only helped document the traditional knowledge related to *pilón* but also established a basis for future comparative research and initiatives to protect this cultural heritage. This method has been used in similar studies (Martínez & Rivera 2019), promoting immersion in daily production practices and encouraging active participation in hands-on activities.

Photographic Recording

A comprehensive step-by-step photographic record was made, documenting everything from the infrastructure—workspaces, tools, and raw materials—to the technical details of each production stage. The captured images created a chronological visual archive that shows the transformation of the plant (sugarcane) into the final product (*pilón*), emphasizing technical gestures, tools used, draft animals (two horses), and specific features of the artisanal method.

For the systematic documentation of *pilón* production, high-performance smartphones were used, specifically the iPhone 13, Galaxy S23, and Motorola G9 Power models, chosen for their technical features. These devices have cameras of at least 12 megapixels, enabling the capture of high-definition images.

Equipment was set to maximum resolution, recording simultaneously in JPEG and RAW (DNG) formats to ensure optimal detail preservation. White balance was kept on automatic, with manual adjustments made, when necessary, while ISO sensitivity ranged from 32 to 800, adapting to varying lighting conditions in the production environment.

Storage and Selection of Photographs

Data from participant observation was analyzed using the categorization technique of Minayo *et al.* (2002), which organizes and interprets empirical elements such as expressions, practices, and images. Based on photographic documentation and the sociocultural practices observed in the local community, analytical categories were identified and systematized (Campos *et al.* 2019). The interpretation of these categories aimed to capture the meanings attributed by the actors to their own actions, recognizing local knowledge and forms of social organization within the context of artisanal *pilón* production.

The images were stored in a cloud-based digital repository, organized to follow the operational sequence of *pilón* production. The records were sorted into chronological categories, such as sugarcane planting, the start of milling, and packaging. For choosing photographs, priority was given to those showing the most representative elements of each stage in the process. Selection criteria included photographic quality (sharpness, lighting, framing), informational content (accuracy in depicting each stage), and analytical value (ability to highlight relevant aspects). It is worth noting that the curation process was conducted fairly, based solely on image quality, without considering the brand or model of the equipment used.

Results

Through participant observation, we identify five stages in the *pilón* production process: sugarcane cultivation and processing, cooking, molding and unmolding, packaging, and commercialization. The detailed steps of the *pilón* production process are described below (Figure 2).

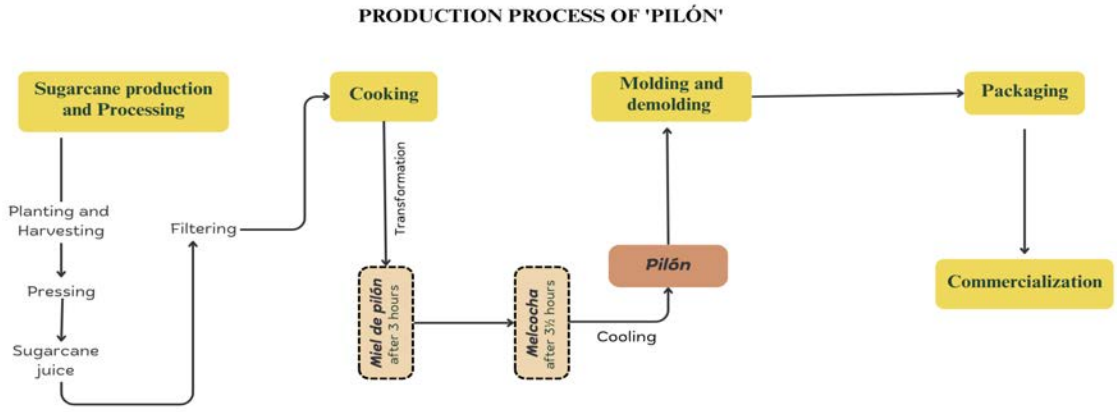

Figure 2. Flowchart of the traditional sugarcane milling process for *pilón* production in Santa Mónica, Tianguistengo. Yellow boxes indicate the production stages. Solid arrows represent the direction and flow of the process. Dashed-line boxes indicate the by-products obtained prior to *pilón*.

Sugarcane Cultivation and Processing

Cultivation starts with planting sugarcane (*Saccharum officinarum* L.) in *melgas* (furrows prepared for cane harvesting), with 1.20 m spacing between *melgas* and 1 m between plants (Figure 3A). According to the producers — there is no specific name for this activity — the average growth cycle is about two years, after which the cane reaches maturity for processing.

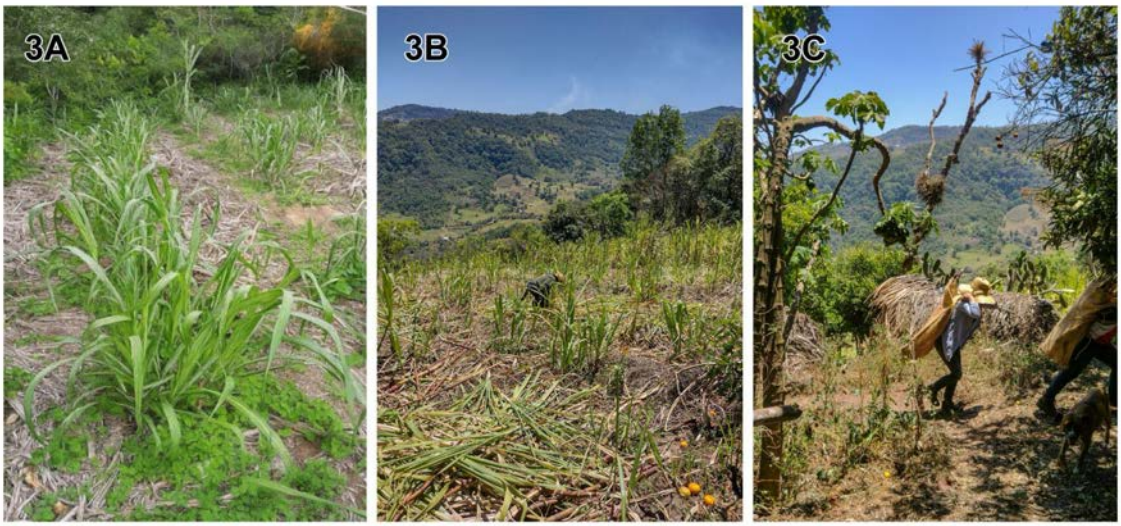

Figure 3. Sugarcane (*Saccharum officinarum* L.) cultivation: (A) planting in ridges with 1.20 m spacing between *melgas* and 1 m between plants; (B) manual cutting of cane with a machete; (C) transport of cane in sacks to the trapiche area for processing.

During harvest, one person manually cuts the stalks with a *machete* (Figure 3B), while others transport them to the area where the *trapiche* is located (Figure 3C), a traditional mill powered in this case by animal traction (This is considered traditional because it is powered by animal traction rather than fossil fuels). There, the cane is fed manually into the mill (Figure 4A), where two horses, guided by a handler, walk in circles to operate the mill that extracts the cane juice (sap) (Figure 4B).

Figure 4. Sugarcane milling in a traditional *trapiche*: (A) cane stalks are fed manually into the *trapiche*; (B) two horses, guided by a handler, walk in circles to operate the mill, pressing the cane and extracting its juice (sap).

For each batch of *pilón*, producers process enough cane to produce 200 liters of juice. This amount is estimated using a standardized reference measure (80 cm high, 80 cm wide, and 1.5 m long) placed next to the trapiche, serving as a practical guide for producers to determine the volume of raw material needed (Figure 5). Milling occurs twice daily, in shifts locally known as *posturas*.

Figure 5. *Trapiche.* The arrow indicates a reference measure of 80 × 80 × 150 cm placed next to the *trapiche*, used to estimate the volume required to produce approximately 200 liters of cane juice.

Cooking and reduction of the juice

Once the cane juice has been extracted, it is filtered using a wooden *colador* (Figure 6A). The filtration occurs directly into the *puntera*, a rectangular iron container measuring 1.80 meters in length, 1 meter in width, and 50 centimeters in height. The *puntera* is placed above a clay and stone-fired oven (Figure 6B). Cooking is done with dry firewood, preferably *ocote* (*Pinus* spp.), known for producing an intense and steady flame (Figure 7). According to the producers, about 50 logs of firewood (0.80 m^3) are needed to complete one *postura*.

Figure 6. Cooking and reduction of the cane juice: (A) the extracted juice is filtered using a wooden *colador* and poured into the iron *puntera*; (B) the *puntera* is placed over a wood-fired oven built with clay and stone for cooking.

Figure 7. *Ocote* firewood (*Pinus* spp.), used primarily for its intense and steady flame.

The cooking process takes about four hours, during which the juice gradually transforms (Figure 8A), first into *miel de pilón* (Figure 8B), and then into *melcocha* (Figure 8C). Once the *melcocha* stage is reached, two members of the group carefully remove the *puntera* from the fire using a long wooden pole (Figure 9A). At this point, the hot mass must be stirred constantly with a *wooden rake* for 15 to 20 minutes until it reaches the solidification point needed for *pilón* molding. Readiness for molding is checked with a traditional manual test: with the rake, a small amount of the mixture is dropped onto the rest of the product; if it does not sink, it is ready for molding (Figure 9B).

Figure 8. Stages of *pilón* production: (A) cane juice (sap); (B) *miel de pilón*; and (C) *melcocha* attached to sugarcane stalk.

Figure 9. Solidification process: (A) the *puntera* is removed from fire with the aid of a long wooden pole to allow cooling; (B) with the help of the tool called *rastrillo,* the *pilón* is cooled for subsequent molding

Molding and Unmolding

Molding is a crucial step in the process, requiring accuracy, speed, and significant hands-on experience—skills that are essential at this stage. First, the woman from the family group carefully washes the clay containers, known locally as *molde* (molds), each with a capacity of 900 to 1000 ml. She then places them on the sugarcane bagasse (pressing residue) (Figure 10A). These tasks are carried out simultaneously with the milling to maximize the efficiency of collective work.

Figure 10. Molding of *pilón*: (A) clay molds are carefully washed; (B) *pilón* is poured into the molds with the aid of a *guaje* (*Lagenaria* sp.); (C) *guajes*, the *cucharón* used to fill the molds with *pilón*.

Once cleaned, the molds are moistened to prevent the *pilón* from sticking to their walls during pouring. The hot, viscous mixture is manually transferred from the *puntera* into the molds (Figure 10B). For this task, a *guaje* (dried fruit of a Cucurbitaceae plant of the genus *Lagenaria*) is used, functioning as a *cucharón* (Figure 10C). In addition to the *guaje*, various wooden utensils are employed to help with pouring. One person is responsible for pouring the mixture quickly and accurately before it solidifies, while another team member arranges the freshly filled molds (Figure 11A).

Packaging

Once the *pilones* have fully cooled, they are carefully removed from the molds (Figure 12A). Packaging is then done using local plant materials. Each pair of *pilones* is wrapped with pre-washed sugarcane leaves (Figure 12B) and tied with vegetable fibers from *lechuguilla* (*Agave* spp., family Asparagaceae). These fibers are collected in the milling area, roasted in the oven, and finally hand-squeezed to remove excess water, which increases their flexibility and strength (Figure 12C). The *pilones* are grouped in pairs, forming a unit locally called a *mancuerna* (Figure 12D).

Commercialization

On average, each postura produces 48 *pilones*, equivalent to 24 *mancuerna*s (around 2.2 kg per *mancuerna*), which are sold in the town markets of neighboring communities throughout the year (Figures 13A and 13B). This year's production took place over 20 working days, during which 960 *pilones* were produced. Of this total, 50% (480 *pilones*) was used as payment for the use of the processing area. The remaining 50% was divided between household consumption (100 *pilones*; 20.83%)

and sales (380 *pilones*; 79.16%), providing a source of income for the family. The price of each *mancuerna* is MX$90.00 (about 5 USD; June/2025).

During fieldwork, it was observed that while one *postura* was in the cooking phase, milling for the next *postura* had already begun simultaneously. This sequential rhythm of work demonstrates efficient organization in the use of time and resources.

Figure 11. Arrangement of molds: (A) a group member arranges the freshly filled molds; (B) the filled molds are placed on a surface covered with fine ash, which ensures stability and facilitates cooling.

Discussion

As demonstrated throughout this study, artisanal *pilón* production is a culturally significant form of peasant agriculture practice in Santa Mónica, and it is also found in other regions of Mexico (García-Barojas *et al.* 2021; Baca del Moral *et al.* 2018). However, this is not a dominant activity in the community, and there is a trend toward a decline in *pilón* production units over time. Artisanal *pilón* production illustrates the close relationship between technical knowledge, natural resource management, and family cooperation, elements that support the continuity of this practice within the community. This activity encompasses economic, cultural, and symbolic dimensions that have persisted despite pressures from the dominant agro-industrial model. Its development shows a highly organized technical system, rooted in traditional knowledge, intergenerational practices, and a strong sense of family cooperation (Romero *et al.* 2011). Visual and participatory documentation not only enabled detailed recording of the production stages but also helped understand the social and cultural dynamics that ensure this activity's ongoing continuity.

Figure 12. Unmolding and packaging of *pilón*: (A) once cooled, the *pilones* are removed from the molds; (B) pre-washed sugarcane leaves used to wrap the *mancuernas*; (C) *lechuguilla* fibers (*Agave* spp.) that have been roasted and squeezed to increase flexibility and used to tie the *mancuernas*; (D) *mancuerna* (local sales unit).

The division of tasks within the family reflects practical reasoning based on gender, age, and experience, as described by Toledo (1990) in his analysis of peasant economies and their symbolic and utilitarian organization. Men handle the most physically demanding tasks, such as cutting and pressing the cane, while women take on essential logistical and technical roles, like cleaning molds and preparing food for the group. This division of labor, rather than just being functional, also conveys values of reciprocity and communal care.

From a practical standpoint, the family process is efficient because stages overlap—such as pressing and cooking—highlighting the role of each family member in *pilón* production. Key knowledge, like the precise cooking point or molding techniques, is passed down through generations. This process goes beyond just technical skills: participating in production involves sharing responsibilities, maintaining collective rhythms, and fostering emotional bonds within the family unit. As Sánchez (2015) notes, this transfer of knowledge not only preserves techniques but also strengthens group identity and cohesion. The depth of empirical knowledge, deeply embedded in culture, can be seen from planting sugarcane to manually checking the *pilón* as it solidifies or using specialized tools for pouring.

It is important to emphasize that the persistence of traditional production methods, such as artisanal, small-scale, and low-technology processes, has been seen by the market as inefficient, precarious, and of low sanitary quality, which limits their competitiveness against industrial sugar (García-Barojas *et al.* 2021). Additionally, the process follows a particular sense of time. Unlike the fast-paced nature of industrial production, the rhythms here are guided by the sugar cane's growth cycle, the heat of the oven, and the texture of the *melcocha*. Time is experienced as cyclical and sequential rather than linear, as demonstrated by the simultaneous start of milling while the previous batch was still cooking. This effective use of time, built

on shared and traditional knowledge, challenges the common prejudice that traditional techniques are inefficient (Escobar 2005).

Figure 13. Commercialization of *pilón* in markets of neighboring communities: (A) *pilón* sold at the Zacualtipán de Ángeles market, Hidalgo; (B) *pilón* sold at the Huejutla de Reyes market, Hidalgo.

The process also revealed traditional practices still in use: *trapiches* operated manually or by animal traction, wood-fired ovens, gourd ladles *guaje*, and clay molds. Although these practices embody technological independence and reliance on local resources, they also create barriers to product standardization and access to formal markets (Jaffé *et al.* 2015). This ambivalence—between cultural strength and productive limitations—remains central in discussions about the future of artisanal *pilón* (Collantes & Atencio-Valdespino 2023).

Another important aspect of these processes is the reconfiguration of community work resulting from the decline of traditional practices. As Romero *et al.* (2011) highlight, peasants' households have started to adjust their productive practices in response to new labor opportunities, which has led to the weakening of the traditional *pilón* system, as also observed in our study. This phenomenon is not only economic but also cultural: when a practice stops representing a viable livelihood, its continuation is significantly undermined.

The visual methodology used in this study captured important details—movements, gestures, expressions—that deepen understanding of the meanings assigned by local actors. As Pink (2013) argues, visual ethnography does not just document images but serves as a form of dialogue with lived experience.

In light of this situation, it is essential that public policies and cultural valorization programs recognize and incorporate these forms of artisanal production as part of Mexico's biocultural heritage. *Pilón* is more than just a traditional sweet; it is a symbol of human-centered agriculture, deeply connected to the land, yet it faces threats from various forces, including market pressures and climate change. Protecting and reviving it requires acknowledging its fundamental role within food systems and viewing the peasantry not as a relic of the past but as a symbol of tradition and an alternative path.

Conclusion

Using photoethnography, this study documented the traditional *pilón* production process in the community of Santa Mónica. Five stages of *pilón* production were recorded: sugarcane cultivation and processing, cane juice cooking, molding and unmolding of *pilón*, packaging, and commercialization. We also documented the traditional knowledge embedded in *pilón* production. We provide an ethnobotanical lexicon that compiles the vocabulary used by local producers in making this sugarcane derivative. This process in Santa Mónica (Tianguistengo, Hidalgo) is part of Mexico's biocultural heritage and should be promoted, valued, and revitalized across different sectors.

Ethnobotanical Lexicon

colador: wooden-framed sieve with a plastic mesh, used to filter impurities from cane juice.
cucharón: kitchen ladle used for serving liquids.
guaje: ladle '*cucharón*' made from the dried fruit of a Cucurbitaceae plant of the genus *Lagenaria*.
machete: Similar to a large knife used for clearing land, cutting sugarcane, among other purposes
mancuernas: local unit consisting of two *pilones* tied together.
melcocha: intermediate by-product prior to the solidification of *pilón*, characterized by a brown color and sticky consistency.
melgas: elongated strips or plots of land with furrows or channels that facilitate drainage and uniform wáter throughout the field, allowing efficient cane management during cutting.
miel de pilón: dark, viscous syrup obtained during an intermediate stage of *pilón* production.
ocote: Common name of *Pinus* spp.
pilón: solid sweetener made from unrefined sugarcane juice; the final product of sugarcane milling.
postura: one complete cycle of *pilón* production.
rastrillo de madera: traditional wooden tool similar to an elongated shovel, used in the final stage of *pilón* production to stir and level the hot syrup, ensuring a smooth and homogeneous texture before pouring it into molds for crystallization.
trapiche: traditional mill, typically made of iron, wood, or stone, designed to extract sugarcane juice using animal traction. These can also be powered by fossil fuels; however, in the area only animals are used.
molienda de caña: process in which harvested and cleaned sugarcane is mechanically pressed to extract raw juice for transformation into *pilón* or sugar.

Declarations

List of abbreviations: Not applicable.
Ethics approval and consent to participate: Informed consent was obtained from the participants. The required permits were obtained by the first author, a native of the locality.
Consent for publication: Not applicable
Availability of data and materials: The data used in the study will be made available upon reasonable request.
Competing interests: The authors have no conflicts of interest to declare.
Funding: The authors thank the National Council for Scientific and Technological Development (CNPq) for financial support, provided through grants 442678/2023-1 (ASC), 200310/2025-9 (CHTM), 200136/2025-9 (TCS) 200332/2025-8 (FIRS), and 200346/2025-3 (MPD). All sources of funding for the research reported should be declared. The role of the funding body in the design of the study and collection, analysis, and interpretation of data and in writing the manuscript should be declared.
Author contributions: Daniela Hernández-Pacheco: made arrangements with the study community, writing—reviewing and editing; Anibal Silva Cantalice: writing—reviewing and editing; Carlos Henrique Tavares Mendes: writing—reviewing and editing; Gabriela González-López: writing—reviewing and editing; Letícia Zenóbia de Oliveira Campos: conceptualization, writing—reviewing and editing; Francisco Igor Ribeiro Santos: writing—reviewing and editing; Marleny Prada De La Cruz: writing—reviewing and editing; Taline Cristina da Silva: conceptualization, writing—reviewing and editing; María Teresa Pulido Silva: conceptualization, writing—reviewing and editing.

Acknowledgements

To the inhabitants of the community of Santa Mónica (Tianguistengo, Hidalgo, Mexico) for sharing their knowledge.

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