Production of Coyol Wine from *Acrocomia mexicana* (Arecaceae) in Honduras[1]

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Production of "vino de coyol" (palm sap wine) from Acrocomia mexicana *(Arecaceae) was observed in Honduras. Trees are selected, felled, and tapped by cutting a small trough into one section of the crownshaft. The sap is collected, bottled, allowed to ferment for 24 h, and sold. The resulting beverage contains 12.86% alcohol but has little nutritional value. This is an example of a small-scale industry based on the harvest of wild palms.*

Produccion de Vino de Coyal Extraido de la Palma *Acrocomia mexicana* (Arecaceae) en Honduras. *La producción de "vino de coyol" o vino de savia de palma de la especie* Acrocomia mexicana *ha sido reportada en ciertas regiones de Honduras. La pequeña industria local se basa en la cosecha y producción del vino, obtenido a partir de dicha palma que se encuentra en estado silvestre. Una vez que los árboles son seleccionados y talados, una incisión de tamaño y forma variable en la base de la corona de hojas, favorece la salida de la savia que, es posteriormente colectada en botellas. El tiempo de fermentación del producto así colectado es de 24 horas, una vez listo el vino, este es vendido en los mercados locales. Dicho vino es de escaso valor nutritivo y su contenido en alcohol es del 12.86%.*

Palm wine obtained from the sap of various species of palms is a common beverage in many areas of Africa and Asia. Known as toddy or palm wine (Dahlgren 1944; Dransfield 1976; Pinheiro and Balick 1987), it is primarily harvested from a decapitated inflorescence still enclosed by its protective bract. Other methods of producing palm wine are known. Freytag (1953) authored a semi-popular article about the value of the coyol (*Acrocomia mexicana* Karw.) as a source of palm wine. During a recent trip to Honduras I had the opportunity to observe the production of coyol wine, or "vino de coyol" as it is known locally. The single commercial producer and vendor of coyol wine in the town of San Pedro Sula has a stand near the outskirts of the city on the road to La Lima (Fig. 1–2). He agreed to take me to his extraction site a few kilometers away to observe his technique. He has been selling coyol wine for many years and learned the technique from people in the southern part of Honduras where he previously lived. It is not known whether there are other commercial vendors still in that area; I did not observe commercial production of this wine in any other region during a recent (1987) 3-wk trip to many parts of that country.

HARVEST

Trees for coyol wine production are carefully selected, based on a number of criteria. Senile trees do not bear well, nor do young ones with slender stems. Middle-aged trees that are flowering or fruiting are said to be the best. As many

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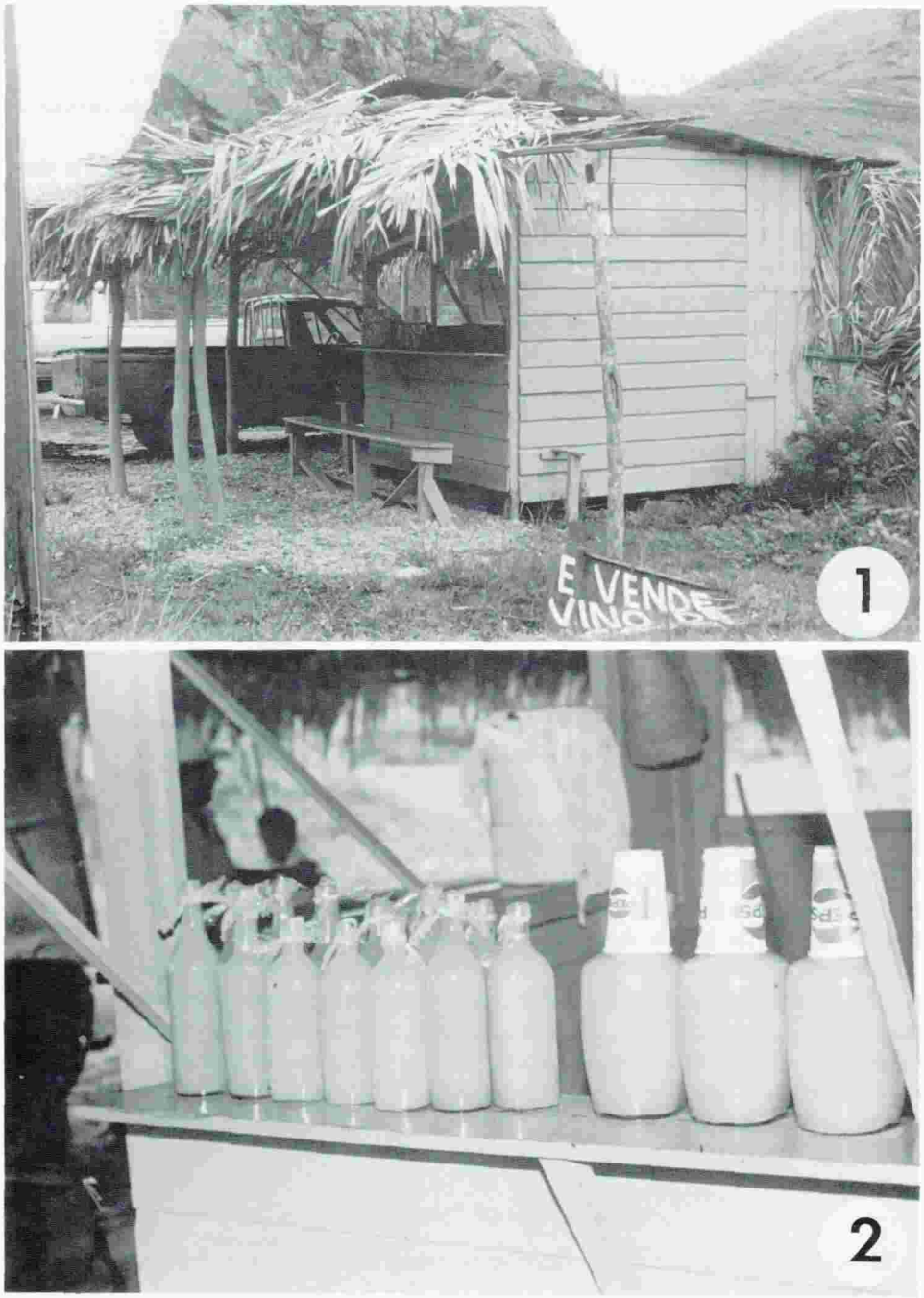

Fig. 1–2. Coyol wine. **Fig. 1.** "Vino de coyol" stand where fermented sap of *Acrocomia mexicana* is sold. **Fig. 2.** Bottles of "vino de coyol."

of the stands of *A. mexicana* growing near San Pedro Sula are on hillsides, only palms that can be maneuvered into a horizontal position are chosen for cutting. This is necessary to enable the maximum flow of sap. It is also necessary to ensure that there are no obstructions such as surrounding vegetation that would misdirect the heavy trunk as it is cut.

A coyol tree can be felled within 10 min. The area around the crown is then cleaned to facilitate harvest over the period of the palm's useful life (Fig. 3). Because the bracts, leaf sheaths, and rachises of this species are so spiny, there is always a danger to the collector, who must traverse a path through the cut palms twice per day while loaded down with his collecting equipment and "tambores," 5 gal plastic jugs. A clean area is thus vital to efficient harvest. Removing the spiny palm parts from the area takes another 5–10 min, depending on the condition of the palm. For example, if the palm has been exposed to frequent burning, some of the threatening spines (Fig. 4) are absent, and less caution is required. Two leaf sheaths removed from the upper stem of the plant are cleaned of their spines and set aside for later use.

At this stage the process of peeling away the exposed portion of the crownshaft is begun, boring into the young tissue known as the heart or "palmito." Working carefully with a large machete, the worker strips away layer after layer of sheath base until the outermost portion of the palmito is evident (Fig. 5). The palmito is a different color than the interior tissue of the sheath bases: the former is a shiny creme-yellow; the latter, a duller white.

A small club fashioned from a nearby tree is used to tap a carving knife into the palmito. A rectangular cut about 15 cm long × 10 cm wide is made into the heart of the stem (Fig. 6). The knife is pounded deeper and deeper into the stem, while carefully keeping the sides of the rectangular trough straight. During this process human hands must not touch the trough or palmito, as contamination will result. A long-handled spoon is used to ladle out pieces from the trough. Within 10–15 min the trough is complete. Care is taken to make a 90° cut across the vessels of the palmito to ensure the maximum flow of sap. It is also important not to cut too far below the palmito, as this will limit the flow of sap.

The trough, now about 10 cm deep, is quickly covered with a piece of heavy plastic sheeting topped off by the two sheath bases that were previously prepared (Fig. 7). If it is not covered, flies, mosquitoes, and bees quickly invade the trough to consume its sweet contents. Most trees are felled in the morning; by the next day the trunk is filled with sweet sap ready for harvest. An extra canal is cut at the bottom of the trough on the end near the stem to divert rainfall that might otherwise run into the trough.

PREPARATION OF "VINO DE COYOL"

Sap is collected twice a day from most trees; sap flow from recently cut palms is so strong that collection three times per day for the first few days is possible. Collection is usually in the early morning and late afternoon. The foamy sap (Fig. 8) is ladled out into a jug, which is taken to the roadside stand and divided into 1 liter bottles. It is also sold by the cupful from large jugs, and chilled with ice. The freshly collected sap is sweet tasting. It is allowed to ferment naturally for

Fig. 3–4. Coyol wine. **Fig. 3.** Cleaning the area around a fallen coyol tree to facilitate harvest for wine production. **Fig. 4.** Trunk spines of *Acrocomia mexicana* that must be removed prior to tapping.

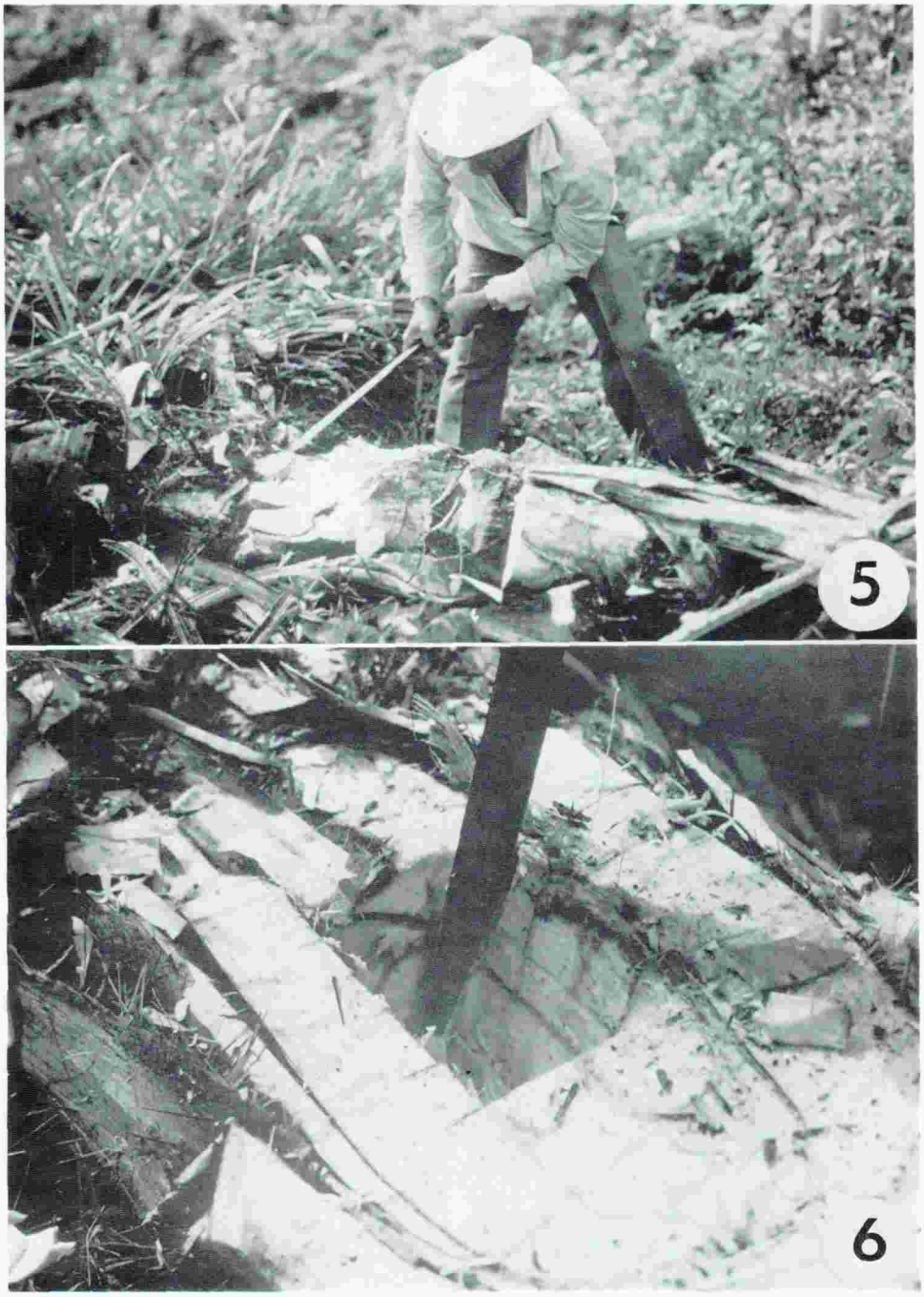

Fig. 5-6. Coyol wine. **Fig. 5.** Stripping away layers of the sheath to gain access to the "palmito" for wine production. **Fig. 6.** Rectangular trough cut into the crownshaft of the palm.

Fig. 7-8. Coyol wine. **Fig. 7.** A plastic sheet is used to cover the trough and keep contaminants out of the sap during wine production. **Fig. 8.** Foamy sap fills the crownshaft trough several times each day.

24 h prior to sale. In the bottles there is a constant foaming from the rising of bubbles through the fermentation process; this process is known locally as "herviendo" or boiling of the wine. When fresh, fermentation proceeds naturally; within 24 h, however, sugar must be added to keep the process going. In a 30 liter jug, 4.5 kg of sugar is added per day for this purpose. After a few days coyol wine must be sold or it changes into vinegar. Freytag (1953) noted that in southern Honduras the vinegar is flavored with peppers and onions, a practice I also observed in the San Pedro Sula area.

Each day after the extractor ladles the sap out of the trough, a thin layer of palmito, a few millimeters thick, is cut (Fig. 9) to keep the vessels flowing freely. Any trough that has been contaminated with insects, rain, or fungi is immediately abandoned to maintain quality at its highest level.

ECONOMICS OF PRODUCTION

Each tree has a productive lifespan of ca. 25 days. During this time an average of two bottles of sap per day can be harvested. The sales of coyal wine range from 30 to 70 liter bottles per day, depending on the season, heat, and day of the week. At the time I observed production in mid Jul 1987, a minimum of 12 trees were in production. The extractor does not cut the trees from his own land, but buys the trees from local farmers, currently for 2 lempiras (U.S. $1.00) each.

An approximate breakdown of gross economic return is as follows: 15 trees in production yielding 30 liter bottles of coyol wine per day, providing a return of 60 lempiras per day at 2 lempiras retail cost per liter bottle.

Since each tree is harvested for 25 d, a total of ca. 219 trees must be cut each year to keep 15 trees in production year-round (Fig. 10). Annual gross revenue from sales of 30 liters of coyol wine per day is 21,900 lempiras, assuming daily sales throughout the year. Known expenses against this sum are the sales personnel (1 person @ 7 lempiras/day average wage) = 2555 lempiras, and the cost of 219 trees cut at 2 lempiras each, totalling 438 lempiras. This gives an approximate annual net income of 18,907 lempiras assuming the above conditions. If only 70% of this is realized, due to maintenance expenses, cost of ice, plastic cups, reduction in sales, etc., the total net profit per year would be 13,235 lempiras, or 36 lempiras per day. This is a substantial income in an area where the average daily wage for a rural worker is 7 lempiras, and no more than twice that for a low level functionary of an agricultural research institution. At the current rate of exchange (Jun 1987), my estimate of the income received by the extractor is approximately US $6,618 per year. While there is no way to verify this estimate, it is important to realize that this amount is about 10 times the per capita income in Honduras. Of course this is not to suggest that coyol wine could be the basis for a sizable industry, nor could it contribute to the revitalization of the local economy. At present there appears to be enough demand to support one full-time coyol wine producer in the area. During the week I observed the stand, there were from 2 to 20 customers at any single period throughout the day. Most likely there are additional coyol wine merchants in the region, although I was unable to locate any other individuals engaged in this activity. Fruit juice vendors in the area commonly offer coconut milk and orange juice.

Fig. 9. Coyol wine. Shaving off a few millimeters from one side of the trough to keep the sap flowing from the vessels during wine production.

Fig. 10. Field of *Acrocomia mexicana* where tapping for wine production occurs; note the palm stems cut to produce coyol sap.

NUTRITIONAL COMPOSITION

We submitted a single sample of fresh coyal wine to the laboratory of FHIA (Fundacion Hondureña de Investigacion Agricola) in La Lima to learn if there were any nutritionally useful components of this wine. The resulting data, received from FHIA, are presented in Table 1. As is evident, aside from the fact that the alcohol content is 12.86%, coyol wine contains little of interest, except perhaps potassium, from the nutritional standpoint. If the analysis is calculated on a dry-weight basis, the protein content increases, but not enough to consider coyol wine as a nutritional food.

TABLE 1. ANALYSIS OF COYOL WINE.[a]

pH	4.0
Alcohol	12.86%
Brix	16.00%
Protein	0.61%
Phosphorus	38 ppm
Sodium	24 ppm
Calcium	142 ppm
Magnesium	57 ppm
Iron	2.5 ppm
Manganese	0.5 ppm
Copper	0.9 ppm
Zinc	0.2 ppm
Potassium	2540 ppm

[a] Evaluation carried out on a single sample submitted to the FHIA laboratories and analysed by Mayra Contreras and M. I. Zantua, to whom we are most grateful. Analysis carried out on a wet-weight basis.

CONCLUSIONS

The prognosis for this single vendor seems to be continued economic health, although he did tell me he would rather go into the business of mining gold. Given that he exterminates a limited number of trees per year, there seems little damage to local populations of *A. mexicana* from this activity. Far greater damage is being caused through cutting and burning of the fields and forests where the palm occurs. Experience in other areas where this genus occurs leads me to suspect that this species is one of the more resistant of the Honduran palms, and its populations are able to tolerate a great deal of abuse and still survive to some degree. Another species, *Orbignya cohune* (Mart.) Dahlgren, is also tapped for its sap by this farmer. Perhaps there are various species in other areas of the Neotropics where this simple procedure could bring economic return to a few individuals. Finally, it should be noted that these palms are a source of potable liquid for survival or subsistence activities in the tropical forest. This small example of the use of very simple technology to produce food and income from a species of palm provides yet additional evidence as to the value and importance of this plant family throughout its tropical and subtropical distribution.

ACKNOWLEDGMENTS

I am most grateful to Dr. Panfilo Tabora for his invitation to work in Honduras and to John Dickson and P. Tabora for their valued assistance in the field. The staff of FHIA was extremely cooperative during my stay in Honduras. I thank Mario Contreras, Director of Research at FHIA, for his efforts and advice, and Dr. Christine Padoch, for her comments on an earlier version of this paper. This is publication no. 92 of the Institute of Economic Botany.

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