

The Palm Wine Trade: Occupational and Health Hazards

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Abstract

The palm wine trade is an important economic activity for many tropical rural areas worldwide. In West Africa, palm wine holds high sociocultural and traditional values. Wine tappers often climb very tall trees with rudimentary equipment to harvest palm sap and risk severe injuries in the event of a fall. Furthermore, the wine quickly ferments beyond the desired taste and alcohol content, reducing the market power of these tappers. Therefore, to maximize benefits or to enhance shelf life, a variety of components are added to the palm tree sap, introducing the possibility of deadly contaminants. This paper highlights the public health implications of uncontrolled palm wine production and the relative neglect of the wine tapper. We draw from the limited published literature and use Cameroon as a case study. The palm wine trade can be more productive and safe if tappers work in cooperatives to improve their market power. Public health authorities need to monitor the quality of this cheap and common source of alcohol and enact regulations to protect wine tappers from the current level of occupational hazards. There are varying levels of progress to control quality and ensure safety in different parts of the world. Legislation and collaboration with traditional structures may offer a framework for change.

Keywords: Occupational injuries; Wine; Accidents falls; Methanol; Cameroon

Introduction

Palm wine is an alcoholic beverage created from the fermented sap of various palm trees. It can be collected (or tapped) from the oil palm tree *Elaies guineensis* or from the *Raffia* tree *Raphia* sp. which is shorter and thus more accessible.^{1,2}

Fermentation begins immediately after collection as a result of natural yeasts in the air and wine; within two hours, the alcohol content reaches approximately 4%. At this stage, the product is a sweet, white, mildly intoxicating aromatic beverage. Continued fermentation for up to 24 hours results in a more alcoholic, acidic, and sour white drink.¹⁻³ This palm

wine can also be distilled into whisky-like drinks with higher alcohol content (up to 40%). Beyond a certain threshold, the wine no longer gains alcohol content and further fermentation produces vinegar.³

Many factors including the species of the tree, the season of the year, time of day at harvest, and type of soil, impact the alcohol content of the wine.² In fact, these factors play a key role in the characteristics of the final product as rudimentary storage and production facilities do little to preserve the product.

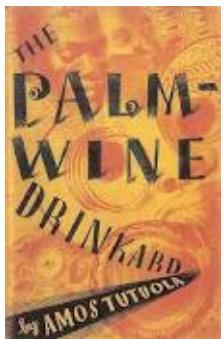
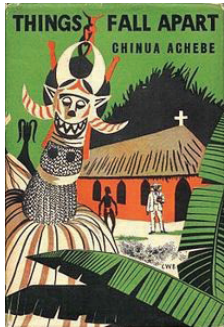
The sap that provides the base of palm wine is extracted and collected by a tapper (tapster). Palm wine tapping is a common occupation in many palm-growing regions of the world—mainly non-Islamic

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TAKE-HOME MESSAGE

- Palm wine tapping is an important economic activity for the rural poor.
- The profession is poorly recognized and very risky.
- The drink can be contaminated at multiple levels of production leading to high risk of serious health consequences.
- Palm wine production should receive regulations for quality control.
- Collaboration with traditional institutions can help to address public health concerns in a culturally acceptable manner.

countries where alcohol consumption is not religiously prohibited. In most cases it involves climbing very tall palm trees using rudimentary climbing equipment, slashing the palm flower until the sap begins to run and attaching a gourd to collect the wine. Palm wine can also be tapped from felled trees which yield higher quality wine but in much smaller quantities.^{4,5} Although felling the tree is a much safer practice, this method of tapping is destructive and the sap stops flowing after 2–3 weeks.⁵ Given that the tapper is most often not the tree owner, the former method is preferred since it preserves the tree for many years at the cost of more labor time, effort and risk. Remuneration is poor and palm wine tappers often lack medical insurance to cover injuries due to falls. Yet, in many countries palm wine carries an important sociocultural and economic value.

This paper discusses the significance of palm wine in communities where it is consumed, the contrasting neglect of the

wine tapper, and the public health implications of palm wine tapping and consumption using the wine tapping industry in Cameroon as a case study.

The Significance of Palm Wine

Palm wine is consumed by more than 10 million people in West Africa, and in lower frequencies in Asia, South America, the Middle East and North Africa.¹ Due to its near-global popularity, palm wine is known by a variety of names in different countries including “Matango,” “Fitchuk,” and “Mbu” in Cameroon, “Doka” in Ghana, “Toddy” in India, “Emu” in Nigeria, “Lambanog” in the Phillipines, and “Panam culloo” in China, just to name a few.⁶

Culturally, African literature is rife with passages describing the production and consumption of palm wine. Chinua Achebe's book, *Things Fall Apart* (1958) portrays palm wine as the main drink for entertaining guests.⁷ Interestingly, this was mirrored in modern media after the British Broadcasting Corporation (BBC) dubbed it a “social lubricant” after a visit to Batibo, the “palm wine capital” of Cameroon.⁸ More references are found in Amos Tutuola's book, *The Palm Wine ‘Drinkard’* (1952), which follows the story of a young man who is disheartened by the death of his favorite palm wine tapper after a fall from a tree.⁹ In Ferdinand Oyono's *The Old Man and the Medal* (1956), the main character consumes too much palm alcohol and loses his most precious possession.¹⁰ Therefore, the palm wine industry is deeply rooted in African traditions, literature, and lore.

Traditionally, palm wine is deeply rooted in West African culture and traditions and thus is the most frequently consumed alcoholic beverage.^{5,11} It is enjoyed at birth celebrations, at funeral wakes, and plays an integral role during traditional marriage ceremonies. It is commonly thought

to be a very nourishing drink which promotes lactation, treats conjunctivitis, and improves eyesight. African traditional healers often infuse palm wine with medicinal herbs to produce a wide variety of remedies.

Palm wine also plays a role in social fabric and order of the rural village. In some villages in Cameroon, it is still expected that a certain quota of all the wine tapped is given to the Chief of the village. Furthermore, the act of sharing wine with the Chief is regarded as a sign of fidelity and homage.⁸ Offering palm wine to another is a longstanding symbol of gratitude and is significant in both business and personal relationships. Village social life revolves around the palm wine kiosk and these establishments enjoy popularity analogous to European salons and cafés.¹² Finally, palm wine is so centric that a popular music, “meringue” is referred to as palm wine music in Sierra Leone.¹³

Historically, palm wine tapping and consumption was discouraged by most colonial and post-colonial governments because it prevented less economically useful activities and promoted local alcohol consumption.^{5,14} However, the economic importance of the palm wine industry in a country like Cameroon should not be overlooked. It employs nearly three-quarters of the male population in some villages, providing a monthly income of 20 000–35 000 FRS CFA (US\$ 40–70) for many tappers.¹⁵ One village can produce approximately 10 000 L of palm wine per day.¹⁶ In Nigeria, the *per capita* income from wine tapping is estimated to be equal to the country's *per capita* income.¹⁷ Here, up to two million metric tons of palm wine are produced in one year.¹⁷ The palm wine trade represents an important source of income in West Africa.^{2,18}

Unfortunately, most of the research on palm wine is in agriculture, microbiol-



Wine tappers work at heights in sub-optimal conditions.

ogy and economics papers. Although the Food and Agriculture Organization (FAO) has shown great interest in the nutritional value of palm products, there is little mention of it in public health literature.^{3,5,19}

Injuries

Injuries cause approximately five million deaths per year worldwide.²⁰ More than 90% of the world's deaths from injuries occur in low- and middle-income countries,²¹ with males in Africa claiming the highest injury-related mortality rates.²² Falls are an important cause of mortality and burden of disease worldwide.²³ Occupations requiring work at heights or in hazardous conditions are risk factors for falls.²⁴ Wine tappers often work at heights in sub-optimal conditions and their falls have been described as “an all too frequent tragedy.”²⁵

The Case in Cameroon

There is little information on the mortality due to injuries in Cameroon. The country is in central Africa; it has a population



A wine tapper from Cameroon

of 20 129 878 (2012),²⁶ and a *per capita* total expenditure on health of US\$ 122 (2010).²⁷ The general government expenditure on health in 2010 was 9% of total government expenditure.²⁷ Out-of-pocket expenditure in 2010 was 66% of total expenditure on health.²⁷ The density of health care workers was 17.9 per 10 000 population in 2004.²⁷

Alcohol consumption rates are quite high and considerably higher when palm wine is taken into account.²⁸ Some Cameroonians spent 30%–80% of their daily wages on alcohol in 1983.²⁹ In more recent years, increasing levels of alcohol intake have been reported.^{30,31} Apart from the physical, psychological, and social harm associated with alcohol consumption, it is consumed at the expense of school fees, food and health care. The effects on non-drinkers (victims in accidents, physical abuse, fetal effects, *etc*) are equally severe. Data from the 2004 Demographic and Health Survey in Cameroon suggest that alcohol consumption is also linked to risky sexual behavior.³²

Profile of a Wine Tapper

Wine tapping is a 100% male profession with the women mostly involved in sales and distribution of the product. Tappers often support households ranging from three to eight persons. A tapper can climb anywhere from 5–15 trees per day depending on and decreasing with age, which ranges from 15–60 years.¹⁸ The tappers are usually not land owners and only 19% of them have a primary education.³³ In some regions, up to 27% of the locals engage in wine tapping activities and women may tap from felled trees, but never climb.³⁴

Public Health Implications

The public health implications of the palm wine trade have two facets. First, this trade is associated with severe occupational hazards that often result in long-lasting physical disability and scarring. Secondly, the abusive consumption of palm wine is an emerging problem in Cameroon with implications for public safety and social awareness.

Although their product is centric to the Cameroonian culture, the wine tappers are relegated to relative obscurity. These workers have a very low income and their profession is officially unrecognized—in registers, they are collectively recorded as “farmers.” The labor itself is very strenuous and comes with the inherent risk and tolerance of frequent falls. They are poorly equipped and use traditional harnesses made from palm fronds with no loops for carrying machetes or other equipment; instead the tapper will scale the tree carrying his machete between his teeth.³⁵

Tappers are uninsured and do not work in cooperatives or unions, leaving them at the mercy of buyers who take advantage of the short shelf-life of the product.³⁶ Palm wine cannot be conserved without con-

siderable resources and the tappers can ill afford such equipment. Preservation requires refrigeration, chemical preservatives and pasteurization—all of which are sophisticated, expensive, and require costly, unavailable inputs.³⁶ Overall, the tappers risk their life and limb for a common product with a short shelf-life. They are relatively unrecognized, lack of sufficient resources to store and process their product, and finally, they are ill equipped to care for themselves in the event of an accident.

When the tappers fall, they do so with severe consequences. Approximately 24% of falls are fatal and about one-fifth (18%) result in permanent disability. These risks increase with age. Furthermore, the severe injuries associated with a long fall (spinal trauma, mouth tear, fractures, dislocations, amputations, and hospital admission >24 hours) can result in a temporary or permanent loss of income, with prolonged and expensive medical and rehabilitative care.^{35,37,38}

Its wide availability, relatively low cost, and high alcohol content place palm wine at the center of a growing issue of alcohol abuse.³⁹ Additionally, palm wine can be distilled into more alcoholic whisky-like drinks which may contain methanol when not properly distilled, leading to blindness, circulatory collapse and even death.¹⁶ Finally, the product may be contaminated by artificial sweeteners, bacteria, dirty containers, or unfiltered water used to increase its quantity, leading to outbreaks of diarrheal diseases. In fact, toxic levels of lead, cadmium and salicylates have been detected in bottled samples of palm wine. These substances do not exist in fresh samples.^{1,39} Therefore, an unregulated palm wine industry represents a serious occupational hazard for the workers, significant public health concerns for the general population, and an enormous burden to the community



A palm wine workshop in Cameroon

and health care system.⁴⁰

Recommendations

Moving forward, it is essential to create awareness among traditional rulers, public health authorities, and the general public about the significant private and public health impacts of an unregulated palm wine trade.

Organization of the palm wine tappers into groups can be the first step toward creating cooperatives to improve their market power and an ideal forum to increase awareness of their occupational risk. Such forums would also represent a great opportunity to provide alternative solutions (*e.g.*, modern climbing equipment). Although currently recognized by the Cameroonian government as “farmers,” wine tappers represent a widespread industry which should receive more regulations to ensure the safety of both the tapper and the consumer. Such regulations would include quality control mechanisms in the palm wine production and provisions to ensure that safe climbing methods are used. In the future, tappers

can be licensed (to tap wine) and their equipment inspected regularly.

Finally, the health care system should develop surveillance and monitoring mechanisms for falls and associated injuries related to the palm wine industry. Since there is so little formal information on this topic, such data will be invaluable for an in-depth epidemiological analysis. Furthermore, health care centers should anticipate and prepare for acute and ambulatory case management and identify the sources of outbreaks of diarrheal disease.⁴¹ With respect to the health of the tapper, compensation mechanisms to reduce out-of-pocket expenditure on health care might help to improve their access to care.

Monitoring the occupational and health hazards of the wine tapping industry is also limited by the logistical difficulties in data collection and analysis. Making use of current social networks for communication to monitor behavioral changes will require community specific interventions that can overcome social, cultural and traditional barriers.

Although producing effective changes in this area may seem be a Herculean task, much has already been done. In Nigeria, formalized fermentation and industrial bottling of wine have already begun with promising results.⁴² Further, this country has also organized palm wine tappers associations (PTAs) to ensure that all tappers are registered with the association—an early form of regulation and official recognition of the industry.⁴³ The Indian government has recognized the impact of the palm wine trade and legislated a ban upon wine tapping and consumption.^{44,45} However, there are many practical difficulties in enforcing such laws. Prohibition of palm wine use has historically been unsuccessful in West Africa and the enterprise has been likened to having “a policeman at the foot of every tree.”^{7,46} Some

effort has also been put into developing safe, inexpensive mechanisms for climbing palm trees.⁴²

It will be challenging to initiate a change without disrupting sociocultural norms. Organizing wine tappers into functional groups, introducing non-traditional climbing material, and controlling the quality of palm wine may meet with fierce opposition. However, such a change will have precedent as workers in other informal sectors (*e.g.*, traditional healers) are now expected to be officially registered with the government.⁴⁷ A similar approach should be applied to the wine tappers in order to gain a basic understanding of the distribution and demographics of those involved in this industry.

Conclusion

It is essential to officially recognize the profession of wine tapping using community level or more formal institutions. Due to the important sociocultural role of palm wine, all interventions will benefit from close collaboration with traditional structures. Further research will help identify the factors associated with increased risk of injury and poor quality of palm wine. Two-pronged legislation that ensures health care coverage for wine tappers in exchange for quality control might provide an attractive framework for optimizing the effects of these interventions.

Conflicts of Interest: None declared.

References

1. Ukhum ME, Okolie NP, Oyerinde AO. Some mineral profiles of fresh and bottled palm wine – a comparative study. *Afr J Biotechnol* 2005;**4**: 829-32.

2. Ezeagu IE, Fafunso MA. Biochemical constituents of palm wine. *Ecol Food Nutri* 2003;**42**:213-22.
3. Food and Agricultural Organisation (FAO). Products of yeast fermentation. In: Fermented fruits and vegetables: A global perspective. FAO agricultural services bulletin No. 134, 1998. Available from www.fao.org/docrep/x0560E/x0560E00.htm (Accessed 1 August, 2012).
4. Bartle P. Abe (oil palm) tapping. Available from www.scn.org/rdi/kw-abem.htm (Accessed 31 July, 2012).
5. Dalibard C. Overall view on the tradition of tapping palm trees and prospects for animal production. *Livest Res Rural Dev* 1999; **11**:1. Available from <http://lrrd.cipav.org.co/lrrd11/1/dali111.htm> (Accessed 31 July, 2012).
6. Noll RG. The wines of West Africa: History, technology and tasting notes. *J Wine Econ* 2008;**3**:85-94.
7. Achebe C. *Things Fall Apart*. London: William Heinemann, 1958. Heinemann Educational Books, 1962.
8. Francis Ngwa Neba. Visiting Cameroon's palm wine capital. BBC News Africa. Available from <http://news.bbc.co.uk/2/hi/africa/1900948.stm> (Accessed 01 August, 2012).
9. Tutuola A. *The Palm-Wine Drinkard*. London: Faber & Faber, 1952.
10. Oyono FL. *The old man and the medal*. London: Heinemann, 1967.
11. Mosha D, Wangabo J, Mhinzi G. African traditional brews: how safe are they? *Food Chem* 1996;**57**:205-9.
12. Awasum NF. The Emergence of Public Spheres in Colonial Cameroon: Palm Wine Drinking Joints in Bamenda Township. *Afr Dev* 2012;**38**:69-84.
13. Collins J. The early history of West African highlife music. *Popular Music* 1989;**8**:221-230.
14. Diduk S. European alcohol, history and the state in Cameroon. *African Studies Review* 1993; **36**:1-42.
15. Falconer J, Koppell C. The Major Significance of "Minor" Forest Products: the local use and value of Forests in the west African humid forest zone. Community forestry note No. 6. FAO, Rome. Available from www.fao.org/docrep/t9450e/t9450e00.htm (Accessed 01 August, 2012).
16. Mosha D, Wangabo J, Mhinzi G. African traditional brews: how safe are they? *Food Chem* 1996; **57**:205-9.
17. Okereke O. The traditional system of oil palm wine production in Igbo Eze local government area of Anambra state of Nigeria. *Agr Syst* 1982;**9**:239-53.
18. Lebbie AR, Guries RP. The Palm Wine Trade in Freetown, Sierra Leone: Production, Income, and Social Construction. *Econ Bot* 2002;**56**:246-54.
19. Dalibard C. The potential of tapping palm trees for animal production. 2007, Available from www.fao.org/ag/againfo/resources/documents/frg/conf96htm/dalibard.htm (Accessed 2 August, 2012).
20. WHO. Violence, Injuries, and Disability: Biennial 2006–2007 Report. Geneva, Switzerland 2008. Available from http://whqlibdoc.who.int/publications/2008/9789241597081_eng.pdf (Accessed 2 August, 2012).
21. Chandran A, Hyder AA, Peek-Asa C. The Global Burden of Unintentional Injuries and an Agenda for Progress. *Epidemiol Rev* 2010;**32**: 110-20.
22. WHO. The Injury Chart Book. A graphical overview of the global burden of injuries, 2002. Available from <http://whqlibdoc.who.int/publications/924156220X.pdf> (Accessed 2, August 2012).
23. WHO. Injury: A leading cause of the global burden of disease, 2000, 2002. Available from <http://whqlibdoc.who.int/publications/2002/9241562323.pdf> (Accessed 5, August 2012)
24. WHO. Falls. Fact sheet No. 344, 2010. Available from www.who.int/mediacentre/factsheets/fs344/en (Accessed 5 August, 2012).
25. Gable E. A Secret Shared: Field work and the Sinister in a West African Village. *Cult Anthropol* 1997;**12**:213-33.
26. Cameroon demographics profile. Index mundi. Available from www.indexmundi.com/cameroon/demographics_profile.html (Accessed 1 August, 2012).
27. Cameroon. Count down to 2015. 2012 report. Available from <http://countdown2015mnch.org/reports-and-articles/2012-report> (Accessed 2 August, 2012).
28. FAO. World drink trends. International beverage, alcohol consumption and production trends, England Hehley-on-Thames: NTC Publications Ltd. 2003.
29. WHO. Global status report on alcohol. Cameroon 2004. Available from www.who.int/substance_abuse/publications/en/cameroon.pdf (Accessed 2 August, 2012).

30. Fezeu LK, Assah FK, Balkau B, *et al.* Ten-year Changes in Central Obesity and BMI in Rural and Urban Cameroon. *Obesity* 2008;**16**:1144-7.
31. Mennen LI, Mbanya JC, Cade J, *et al.* The habitual diet in rural and urban Cameroon. *Eur J Clin Nutr* 2000;**54**:150-4.
32. Kongnyuy EJ, Wiysonge CS. Alcohol use and extramarital sex among men in Cameroon. *BMC Int Health Hum Rights* 2007;**7**:6.
33. Lebbie AR, Guries RP. The Palm Wine Trade in Freetown, Sierra Leone: Production, Income, and Social Construction. *Econ Bot* 2002;**56**:246-54.
34. Mphoweh JN, Tchindjang M, Mfondoum NAH. The degradation of raffia palms and its socio-economic and ecological consequences: the case study of Bamunka, Ndop, North West province Cameroon. Available from http://cameroon-tour.com/geography/Jude_article.pdf (Accessed 5 August, 2012).
35. Mbuagbaw LCE, Okwen PM. Mouth Laceration Due To Fall in Wine Tappers: A Report of 2 Cases. *Internet J Surg* 2006;**7**: 2.
36. Obahiagbon FI, Oviasogie P. Changes in the Physicochemical Characteristics of Processed and Stored *Raphia hookeri* Palm Sap (Shelf Life Studies). *Am J Food Technol* 2007;**2**: 323- 326
37. Tabish SA, Jan RAFA, Rasool T, *et al.* Fall from walnut tree: an occupational hazard. *Inj Extra* 2004;**35**:65-7.
38. Ebong WW. Falls from trees. *Trop Geogr Med* 1978; **30**:63-7.
39. Bisi-Johnson MA, Adejuwon AO, Ajayi AO, *et al.* Meddling with a cultural heritage: Traces of salicylate in adulterated palm wine and health implications MA. *Afr J Food Sci* 2011;**5**:536-540.
40. Mavioga EM, Mullot JU, Frederic C, *et al.* Sweet little Gabonese palm wine: A neglected alcohol. *West Afr J Med* 2009;**28**:291-4.
41. Tulchinsky TH, Varavikova VA. *The New Public Health*. 2nd ed. Elsevier Academic Press, California, **2009**.
42. Oyeku OM, Adeyemo FS, Kupoluyi CF, *et al.* Techno-economic packaging of palm wine preservation and bottling technology for entrepreneurs. *Glob J Soc Sci* 2009;**8**:21-6.
43. Agbo FU, Nweze NJ, Igbokwe EM. Community-level institutions in sustainable exploitation of plam forest resources in south-East Nigeria. *J Econ Int Finance* 2011; **3**:536-41.
44. Davis T, Johnson D. Current utilization and further development of the palmyra palm (*Borassus flabellifer* L., Arecaceae) in Tamil Nadu state, India. *Econ Bot* 1987;**41**:247-66.
45. Das SK, Balakrishnan V, Vasudevan DM. Alcohol: Its health and social impact in India. *Natl Med J India* 2006;**19**:94-9.
46. Slater R. The gold coast: some facts and figures. *Afr Af* 1930;**29**:343-9.
47. Hogle J, Prins A. Prospects for collaborating with traditional healers in Africa. Available from http://pdf.usaid.gov/pdf_docs/PNABL719.pdf (Accessed 5 August, 2012).

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