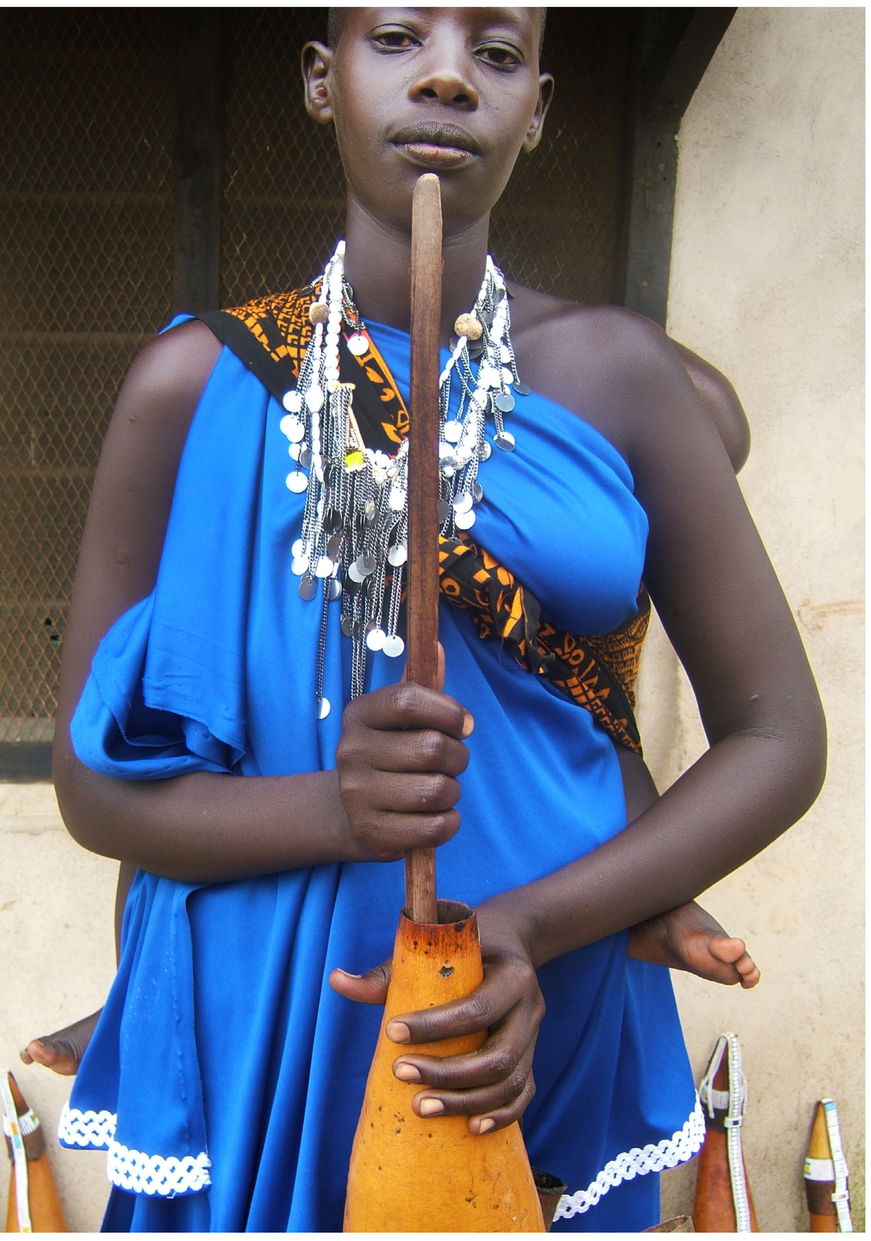
Endangered sustainable innovation: Indigenous milk hygiene and preservation techniques by Maasai too valuable to lose?

Dagmar Schoder[1,2], John Laffa[2], Cameron R. McCulloch[2]

[1]Vetmed University Vienna, Institute of Food Safety, Food Technology and Veterinary Public Health, Austria. [2]Veterinarians without Borders Austria, Austria.



INTRODUCTION

The indigenous Parakuyo Maasai communities of Tanzania are traditional pastoralists who depend on fresh cow's milk as a staple food. However, the arid climate and a lack of clean water challenge milk production and conventional milk hygiene practices. Instead, the internal surfaces of empty, naturally occurring calabashes used for milk storage are smoke-treated by burning a variety of selected local plant materials and this significantly prolongs milk keeping qualities, despite high temperatures (1). We sought to explore this sustainable and poorly understood innovation further by making enquiries throughout eight Parakuyo Maasai regions and 13 districts.

MATERIAL & METHODS

Informational interviews were conducted with 120 knowledgeable pastoralists, we sought to identify the key indigenous plants preferred and establish their traditional manner of use. A semi-structured questionnaire was designed to: (i) determine the plants used, (ii) the parts used, (iii) methods of preparation and utensil smoking, (iv) therapeutic applications and associated health benefits of these plants, and (v) alternative uses; that may suggest why they are used and preferred.

RESULTS

Twenty plants were identified as being the most valuable, comprising predominantly hard wood trees and shrubs with strong aromas and astringent tastes suggestive of a role played by secondary metabolites (3). The most frequently mentioned plants, in order of preference, were: Zanthoxylum chalybeum (prickly ash; overall preference 26.6%), Olea europaea subsp. africana (African wild olive; 11.9%), Combretum molle (velvet bush willow; 11.4%), Cordia ovalis/monoica (satin saucer berry; 9.5%) and C. sinensis (oldoroko; 7.3%). Many of these plants are also used medicinally by these pastoralists for a variety of infectious diseases, suggesting possible antimicrobial properties. Plant choices also tended to vary by local geography and the purpose to which the calabashes were assigned, e.g. old or new calabashes and milk stored for children or mothers.

CONCLUSION

The expertise of selecting these plants and their innovative applications is transmitted solely by the oral tradition. Further, climatic change is adversely affecting herbaceous habitats in these regions and inter-tribal territorial strife and land-grabs necessitate that the pastoralists remain nomadic. Unless we document and attempt to understand this old indigenous and sustainable hygiene know-how, it may be too late.

Nomenclature							
Pos. No.	*Scientific name (Fam.);* Common/English name Swahili (Maasai) names	food	tea/juice	construction material	Images (2)	Parts of plants used	Preparations	medical indications and applications
1	*Zanthoxylum chalybeum Mil. (Rutaceae);* Pricky Ash, Knob Tree Mjafari/Mnungununugu (Oloisuki)	✓	✓			stem bark, roots, leaves,	decoction from bark, infusion as tea, dried powdered roots, crushed leaves for bath, bark for chewing	malaria, sickle cell disease, respiratory tract ailments, skin diseases, abdominal pain, diarrhea, intestinal worms, bilharzias, amoebas, colic, general body pain, vomiting, bacterial muscle infections, female infertility, venereal diseases, uterine fibroids, aphrodisiac, parturition and lactation, asthma, convulsions, oedema, toothache
2	*Olea europaea subsp. africana (Mill.) P. Green (Oleaceae);* Wild Olive; Mloliondo (Olorien)			✓		leaves, wood	smoke produced by combustion, meat-herbal ceremony (Orpuli)	fever, poultice, malaria, colds & flu, pneumonia, gastro-intestinal disorders, anaplasmosis, general body tonic, pediatric respiratory tract infection prophylaxis
3	*Combretum molle (Combretaceae);* Black Combretum/ Bushwillow/ Leadwood; Mlama mweusi (Olmaroroi)	✓		✓		roots, leaves, wood	soup from roots, infusion/concoction, leaf extract, smoke produced by combustion	malaria prophylaxis, circulatory problems, diarrhea, stomach pain, backache, pelvic pain, gonorrhea, bilharzias, coughs, chest pain
4	*Cordia sinensis Lam. (Boraginaceae);* Grey-leaved Saucer Berry,Grey-leaved Cordia; Mnya mate/ Mkamasi (Oldoroko)	✓	✓	✓		roots, bark	decoction	malaria, intestinal disorders , abortifacient, conjunctivitis in cattle
5	*Cordia monoica (Boraginaceae);* Sand Paper; Msasa (Eseki)	✓		✓		roots, leaves	decoction, poultice from roots	ophthalmic pain, wounds, malaria prophylaxis, vomiting in children, dystocia

Table 1. Different applications of the five most frequently stated plants by Maasai communities.

REFERENCES

(1) Schoder D, Maichin A, Lema B, Laffa J. (2013) J Food Prot 76(11):1908-15
(2) http://tropical.theferns.info/
(3) Mekonnen H, & Lemma A. (2011) Trop Anim Health Prod 43:833-84
(4) Laffa JY, McCulloch CR, Szakmary-Brändle K, Wagner M, Schoder D (2017) Vet Med Austria 104:297-309

Contact address: Dagmar Schoder, Vetmed University Vienna, Institute of Food Safety, Food Technology and Veterinary Public Health, Austria.
E-mail: dagmar.schoder@vetmeduni.ac.at