



How a Simple Email Exchange Evolved to Turn Lecturers into Learners in Ghana

Denita Hadziabdic Guerry, Bonnie Ownley and William Klingeman

February 22, 2018

The Beginning of Our Journey



The Journey Continues to D.C.

INTERNATIONAL PROGRAMS
UofT INSTITUTE OF
AGRICULTURE
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USAID-BHEARD Molecular Biology Workshop Summer 2017



USAID BHEARD Workshop Presenters

UTK – Entomology and Plant Pathology



Dr. Bonnie Ownley



Dr. Denita Hadziabdic

UTK – Plant Sciences



Dr. William Klingeman

University of Ghana – Crop Sciences



Dr. Naalamle Amissah



Photo: google.com

Photo: ghc-ca.com

Ghana Short History



- First records of the permanent Ghana territory from 11th century
- European conquest in 15th century
- British colony until March 6th, 1957 (Dr. Kwame Nkrumah)
 - Pan African idea
- Population - 27 million people from diverse backgrounds, languages and faiths
- English is official language; 80 other native languages are spoken



Ghana Short History











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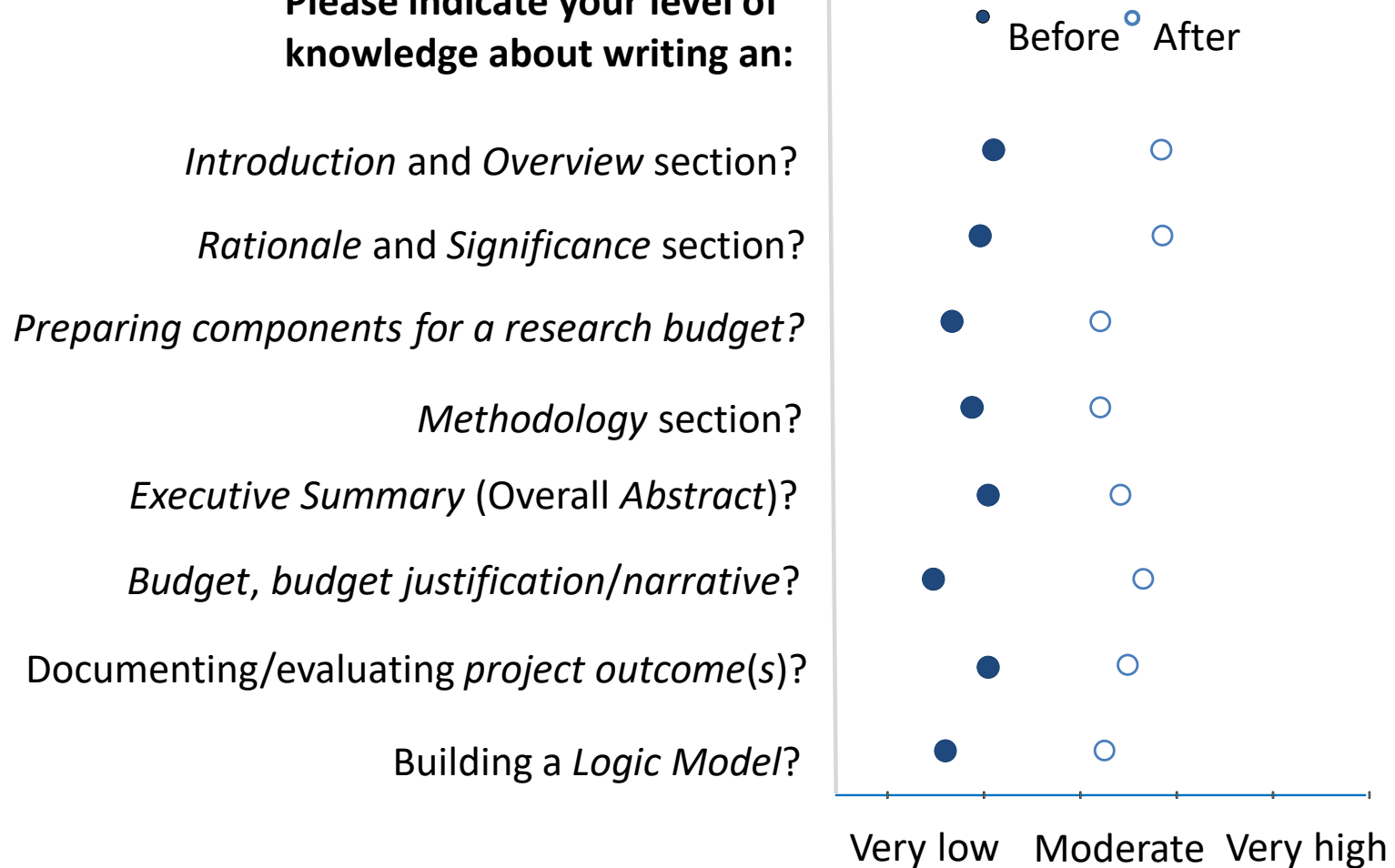
the “*interactions* [that occurred between content] *sections* and the *willingness of facilitators to* [openly] *answer* [participant questions and to] *give out personal experiences*” related to questions asked and situations raised

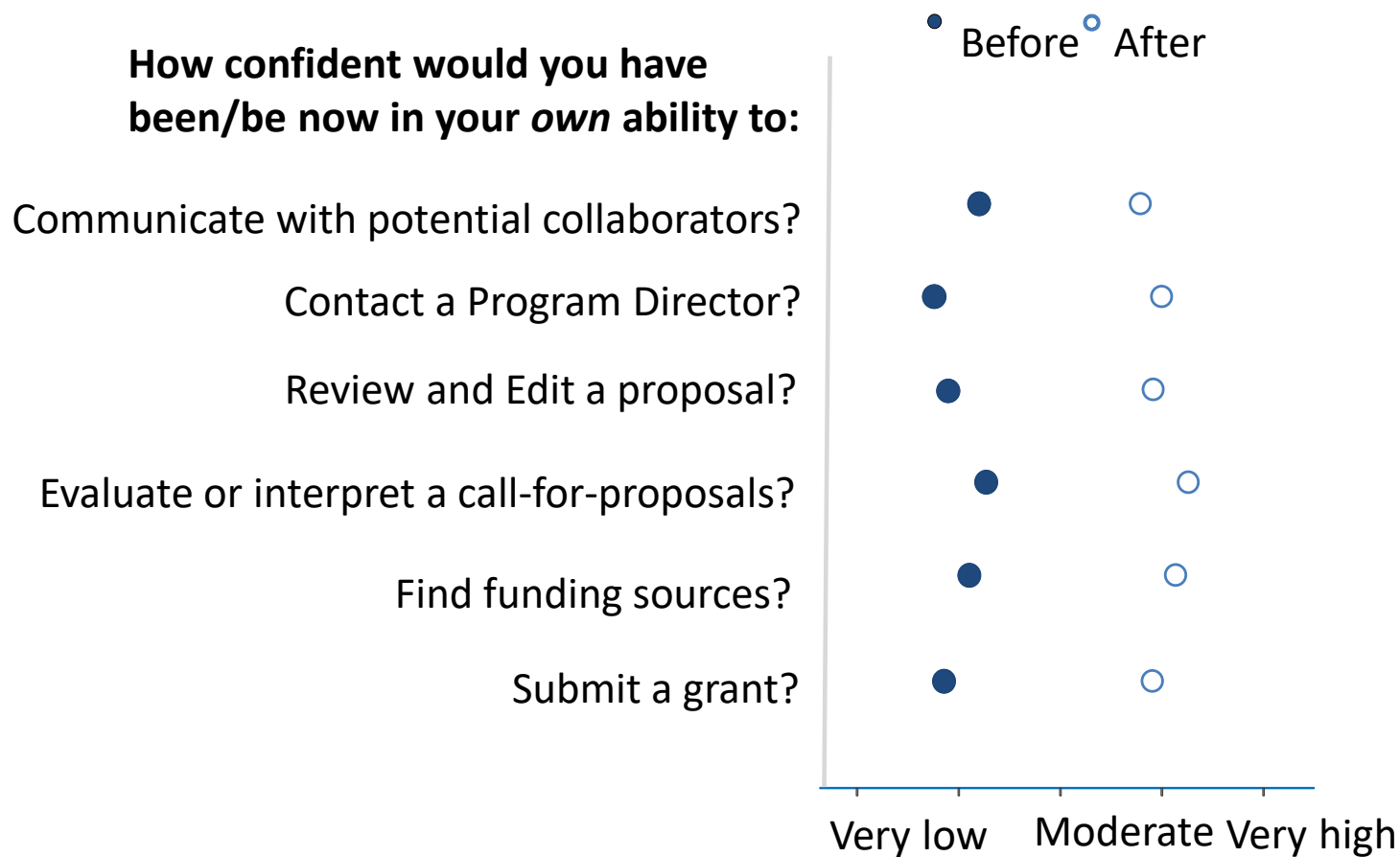
“*the wealth of examples shown and command of topics by facilitators*”

“*enjoyed* [learning from] *different presenter perspectives* [through which we] *were able to synthesize and bring in different disciplinary perspectives*”

“*Best grant training workshop I have attended.*”

Please indicate your level of knowledge about writing an:





University of Ghana, Accra

- Established in 1948
- UG - the oldest and largest of the eight public universities
- 37,940 students (32, 059 undergraduate population)
- 4 colleges (Basic & Applied Sciences, Education, Health Science and Humanities)





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Sinna's Garden, University of Ghana Campus

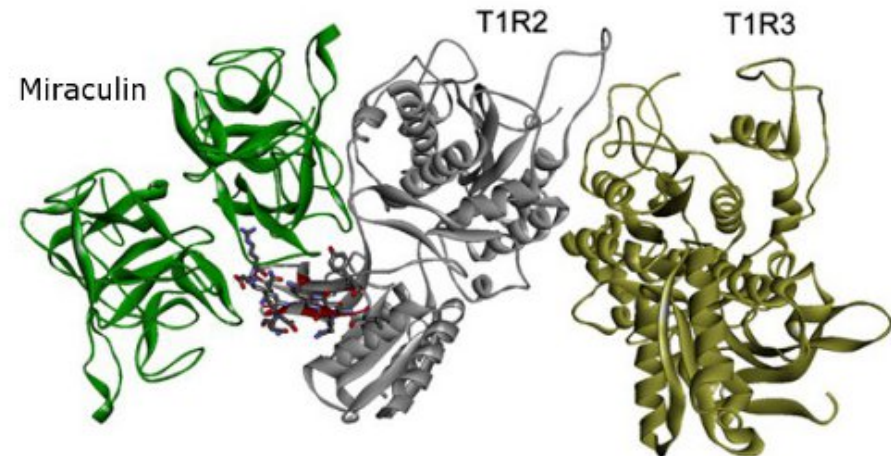




Synsepalum dulcificum (Miracle Berry)



<https://en.wikipedia.org>



Koizumi et al. (2011) Human sweet taste receptor mediates acid-induced sweetness of miraculin. PNAS: 108 (40) 16819-16824

Sinna's Garden, University of Ghana Campus



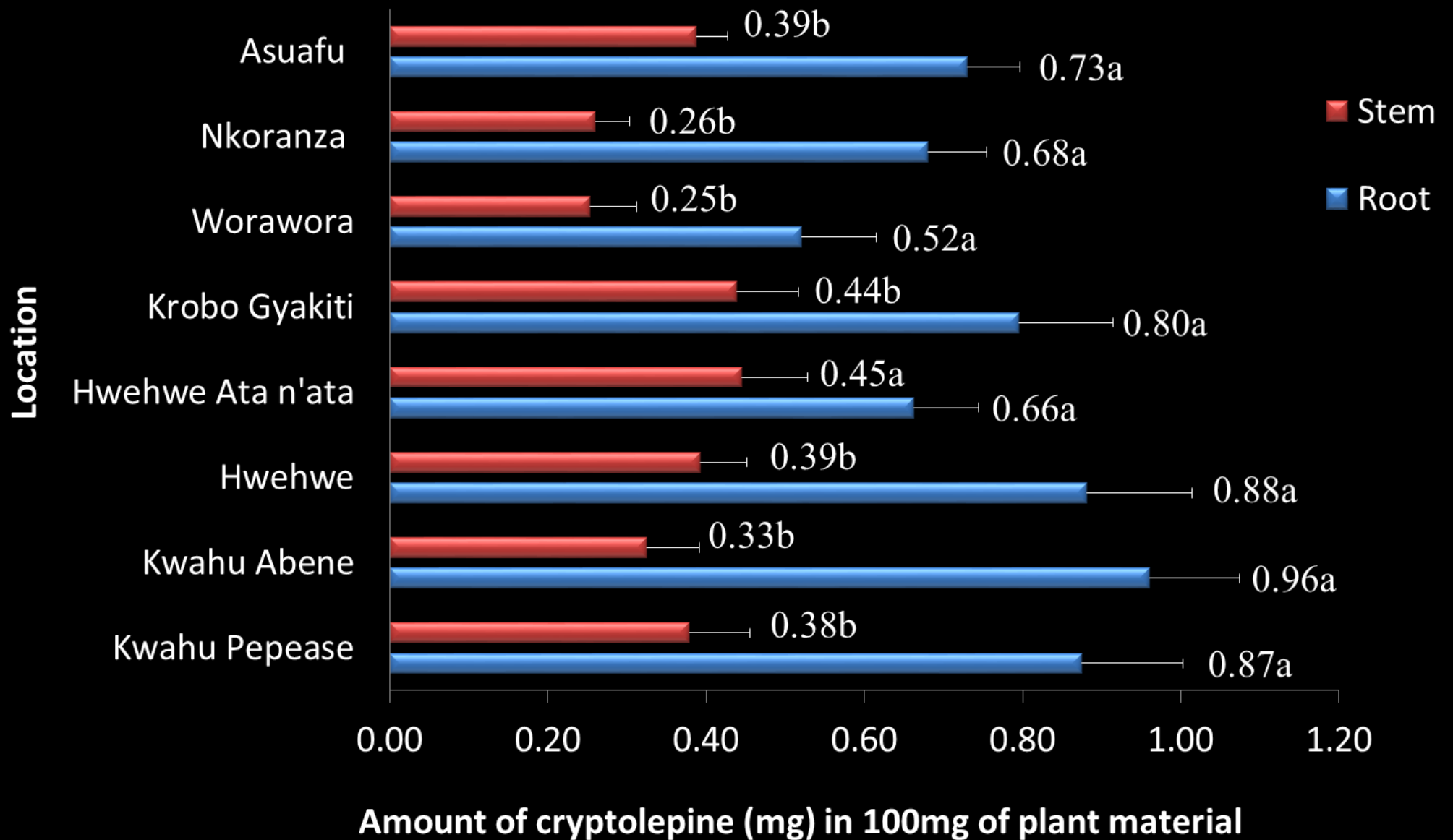


Cryptolepis sanguinolenta - Antimalarial plant



- 75% of the population in urban and rural areas of Ghana depend on medicinal plants (Abbiw *et al.*, 2002)
- *C. sanguinolenta* is on the verge of extinction (Schmelzer, 2007)
 - 90% roots, 5% stem, and 5% leaves
- A standard sack of roots cost ~160Ghc (\$35) [240Ghc (\$ 53); 350Ghc (\$78)]
- 7 out of 12 antimalarial decoctions contained *C. sanguinolenta*
- 330ml bottled product (2-3.3Ghc/~\$1.0)

Images: N. Amissah



Full Length Research Paper

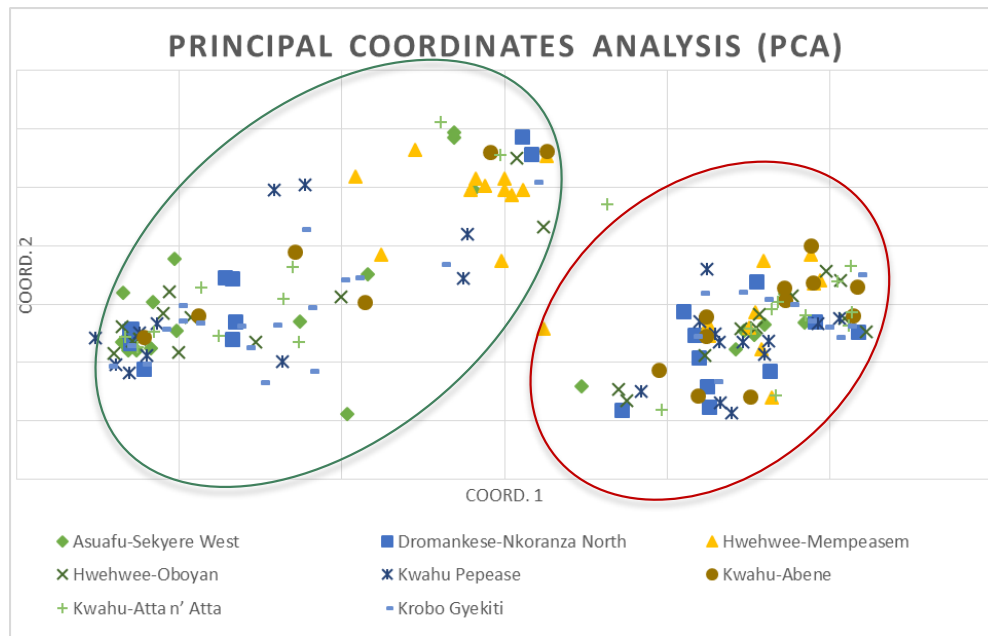
Characterization of thirteen microsatellite loci from the Ghanian antimalarial plant *Cryptolepis sanguinolenta*

Naalamle J. Amissah¹, Phillip A. Wadl^{2,3}, Denita Hadziabdic², Sarah L. Boggess² and Robert N. Trigiano^{2*}

¹Department of Crop Science, P. O. Box LG 44, University of Ghana, Accra, Ghana.

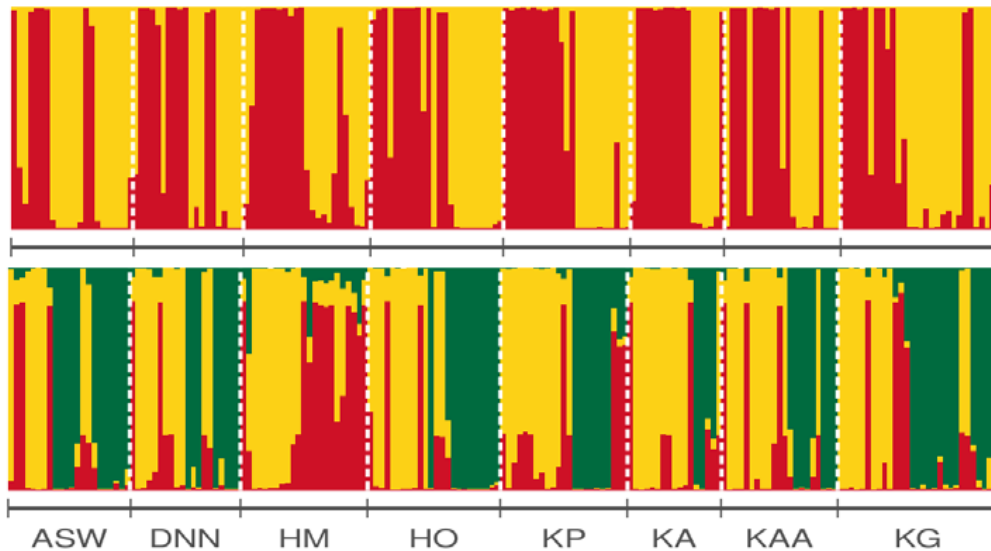
²Department of Entomology and Plant Pathology, the University of Tennessee, 2505 E. J. Chapman Drive, Knoxville, TN, USA.

³USDA-ARS-U.S, Vegetable Laboratory, 2700 Savannah Hwy, Charleston, SC, USA.



Amissah et al. (2018) *In preparation*

- Population structure is best explained with 2 genetic clusters ($K=2$)
- Subpopulations of *C. sanguinolenta* demonstrated very low levels of population differentiation ($F_{ST}=0.05$), high gene flow and lack of isolation by distance
- Populations haven't undergone recent population bottleneck or expansion



Periurban Gardens - Accra



Periurban Gardens - Accra



Periurban Gardens - Accra



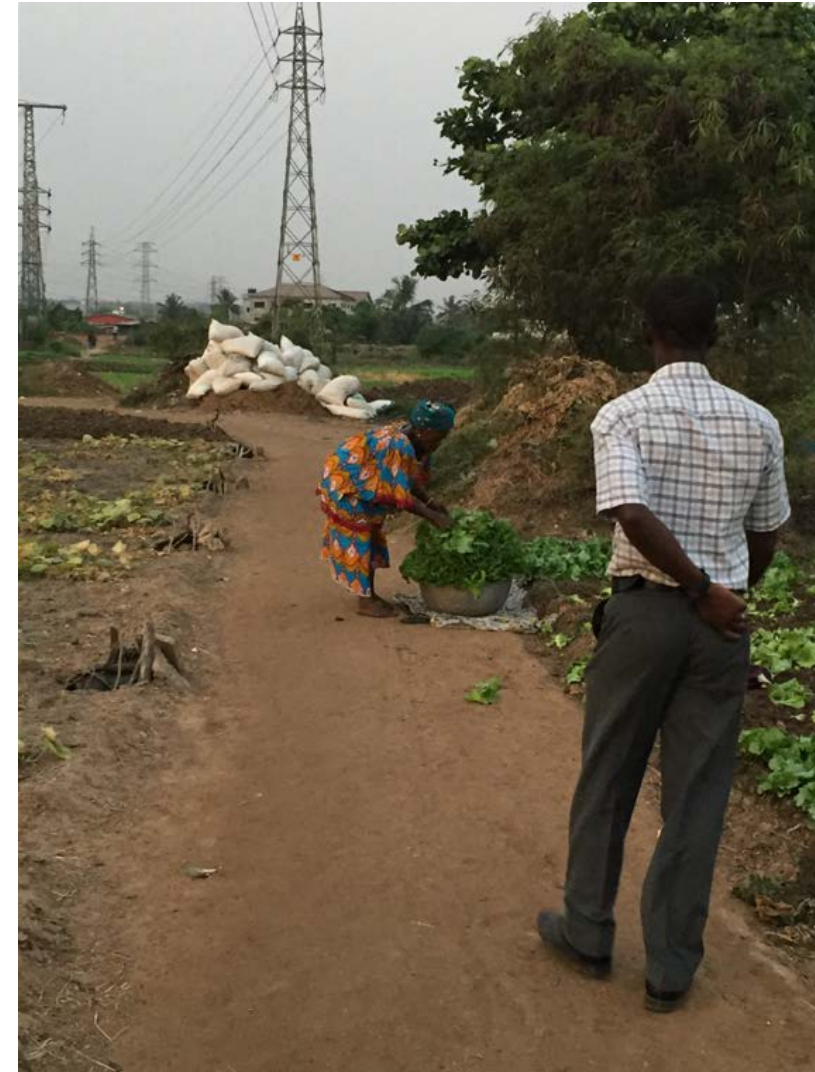
Periurban Gardens - Accra



Periurban Gardens - Accra



Periurban Gardens - Accra



Periurban Gardens - Accra



Papaya Farm - Dansak Farms



Dansak Farms

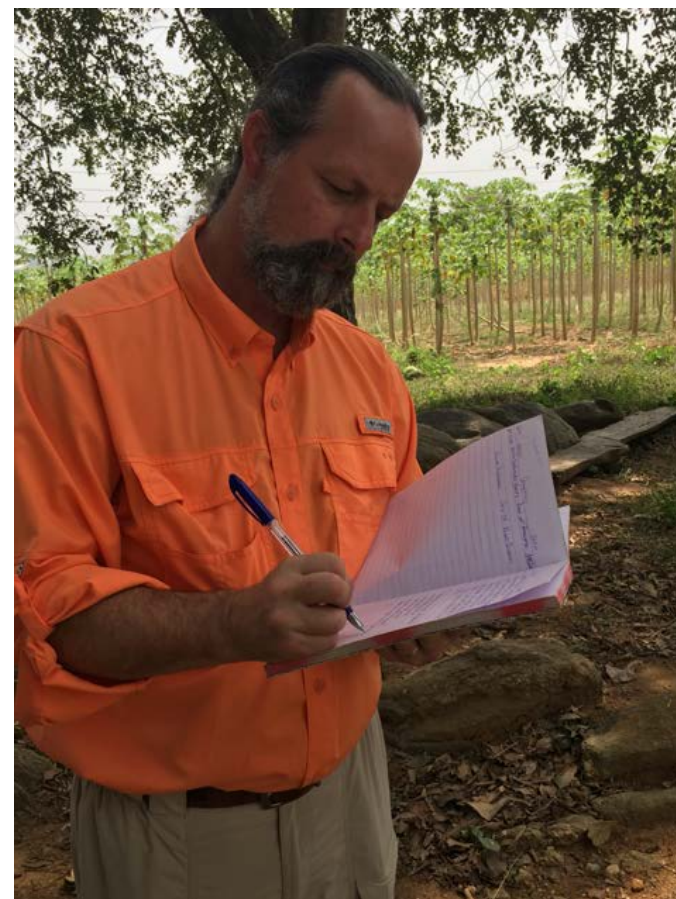
- 233 acres farm of mainly *Carica papaya* (papaya, pawpaw) production
- *C. papaya* ‘Solo’ and ‘Sunrise’ are main varieties grown (rotation w legumes and corn)
- Cassava, corn, tilapia, hydroponic vegetables, cattle, chicken, snails, rabbits, frogs, teak



Dansak Farms



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Dansak Farms



Pineapple Farm - Bomarts Farms



- 4 million pineapples (*Ananas comosus*) produced annually
- Tissue culture main propagation method
- ‘MD2’ (95%) and ‘Smooth Cayenne’ (5%)
- European countries main importers
- Both fresh and dried fruits

Bomarts Farms



<https://bomarts.com>



Bomarts Farms



Photo: Brantlee Spakes Richter, UF

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Phytophthora root rot
(*Phytophthora cinnamomi*)

Bomarts Farms



Bomarts Farms



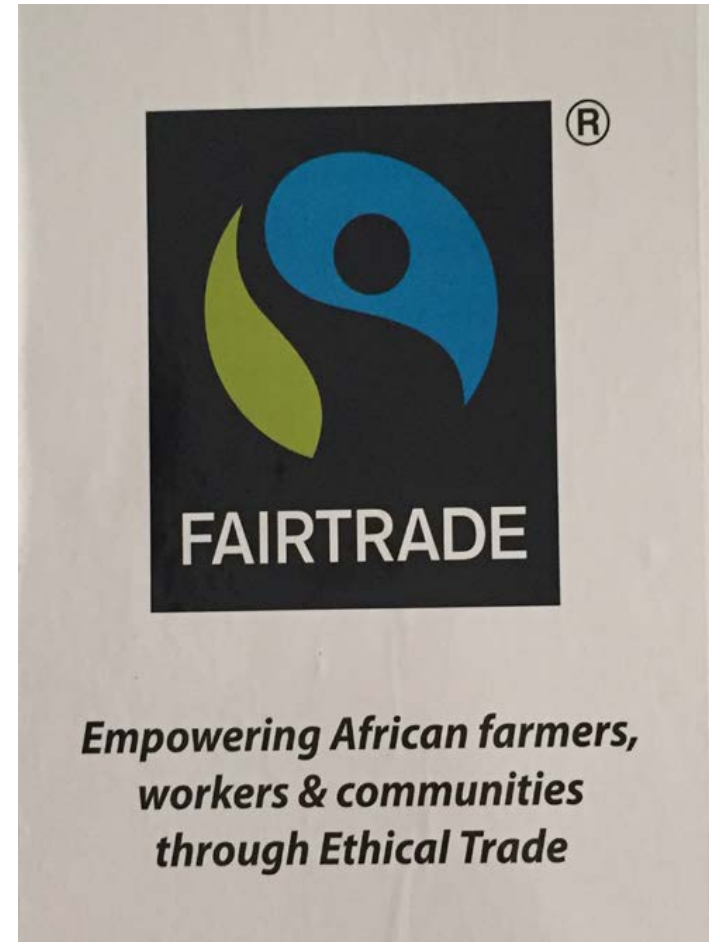
Bomarts Farms



Bomarts Farms



Bomarts Farms



Cacao Farm

- Cacao is main agricultural export of Ghana
- Originated around the headwaters of the Amazon
- 1840s western Africa-Ghana
- Currently there are seven cocoa growing regions namely Ashanti, Brong Ahafo, Eastern, Volta, Central and Western North and Western South regions

Yakubu Minezemah – Ghana Ministry of
Agriculture , Extension Officer
Elvis Appiah, University of Ghana



Cacao Farm



2015-16, Ghana produced 800,000 metric tons of cocoa (20% of the total world harvest)

<https://goodmanamc.blogspot.com>



<http://www.divinechocolate.com>

Cacao Farm



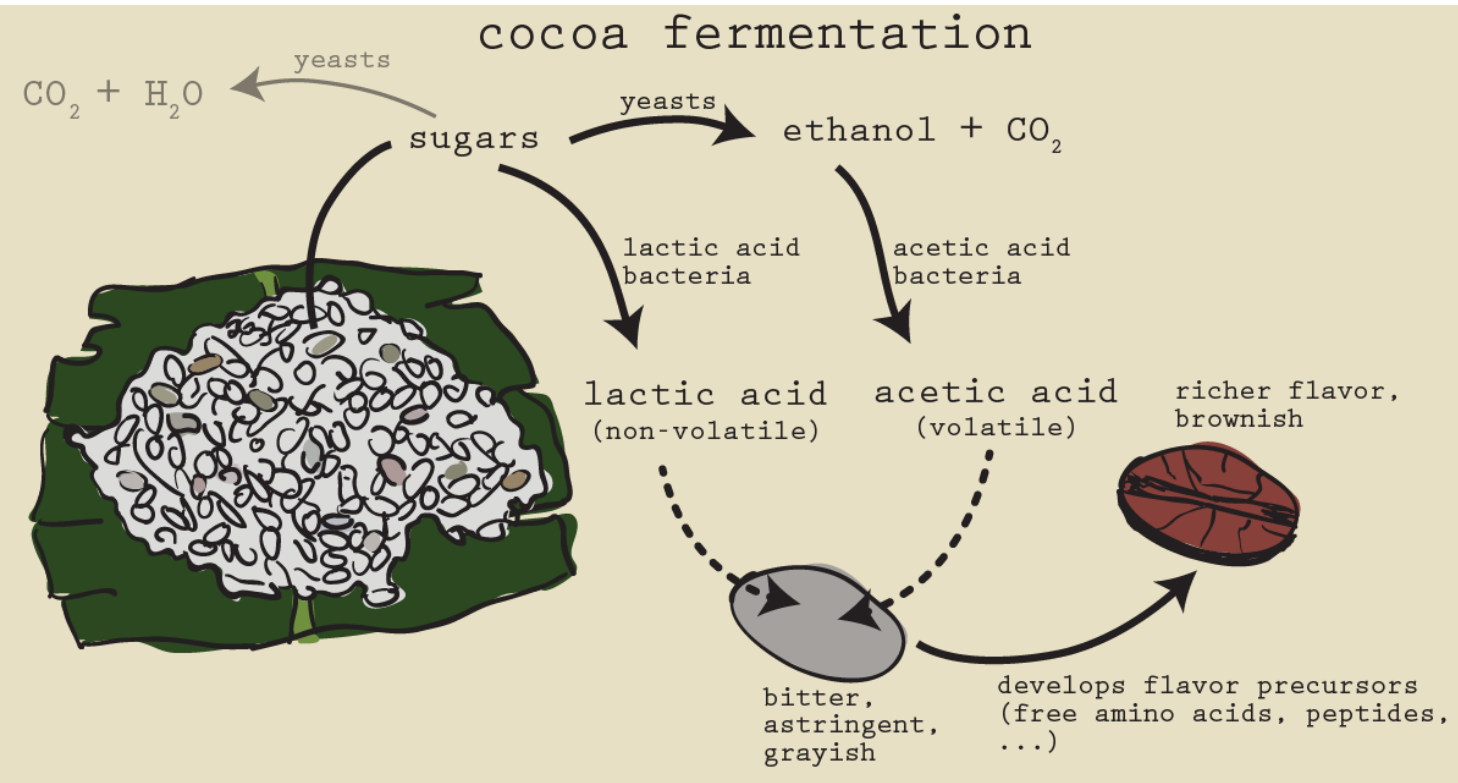
Cacao Farm



Cacao Farm



Cacao Farm









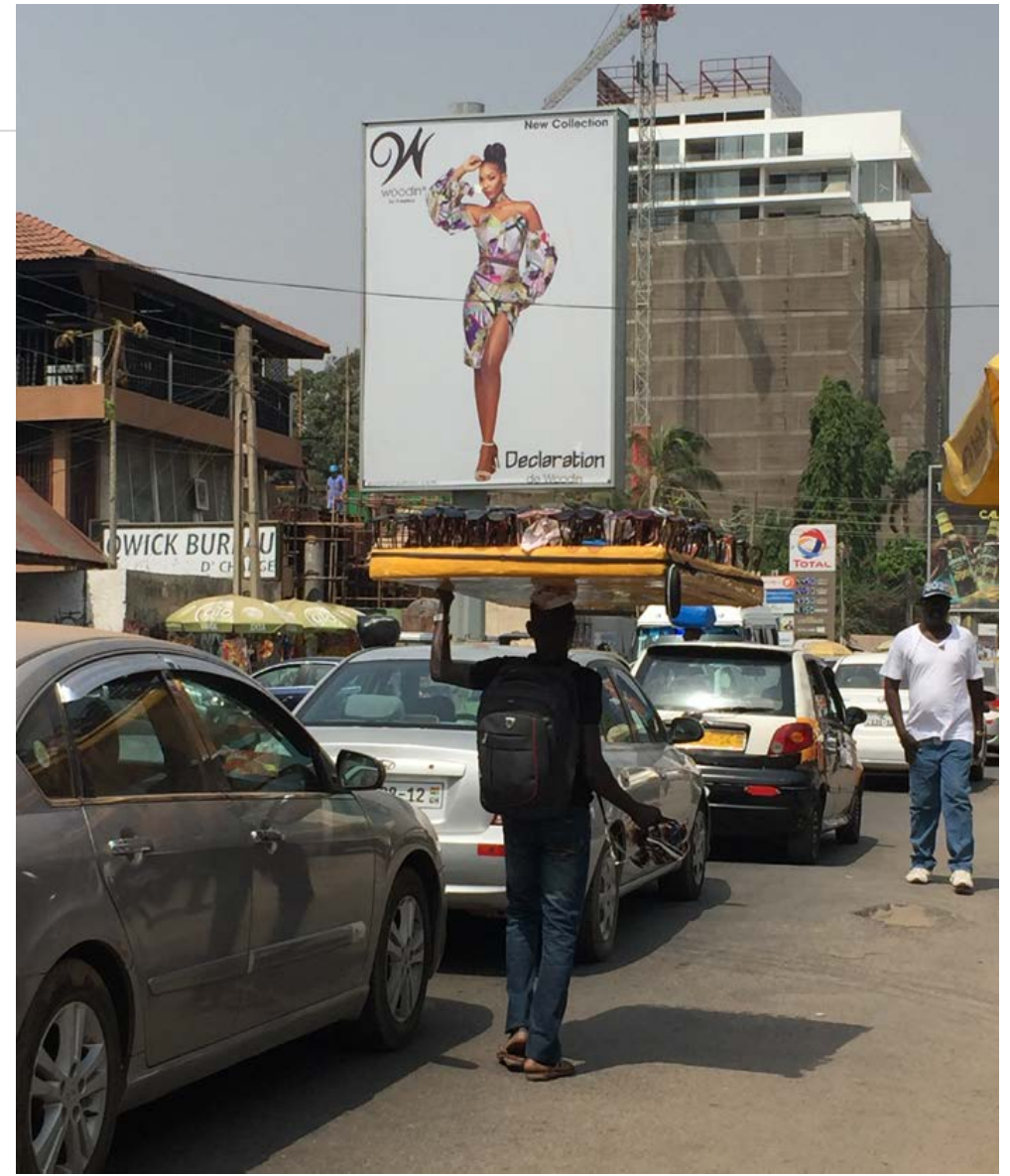
Ghanaian Food



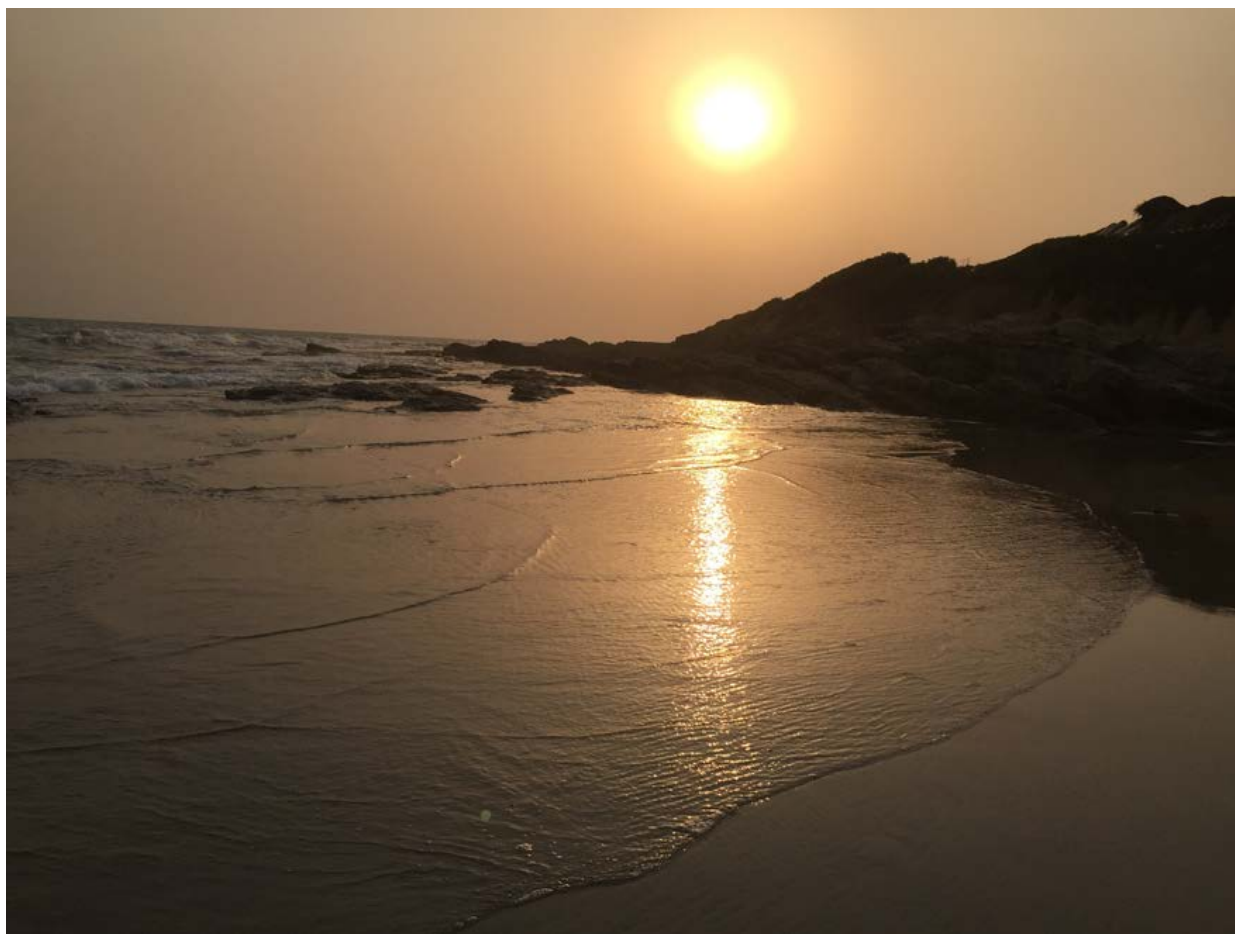


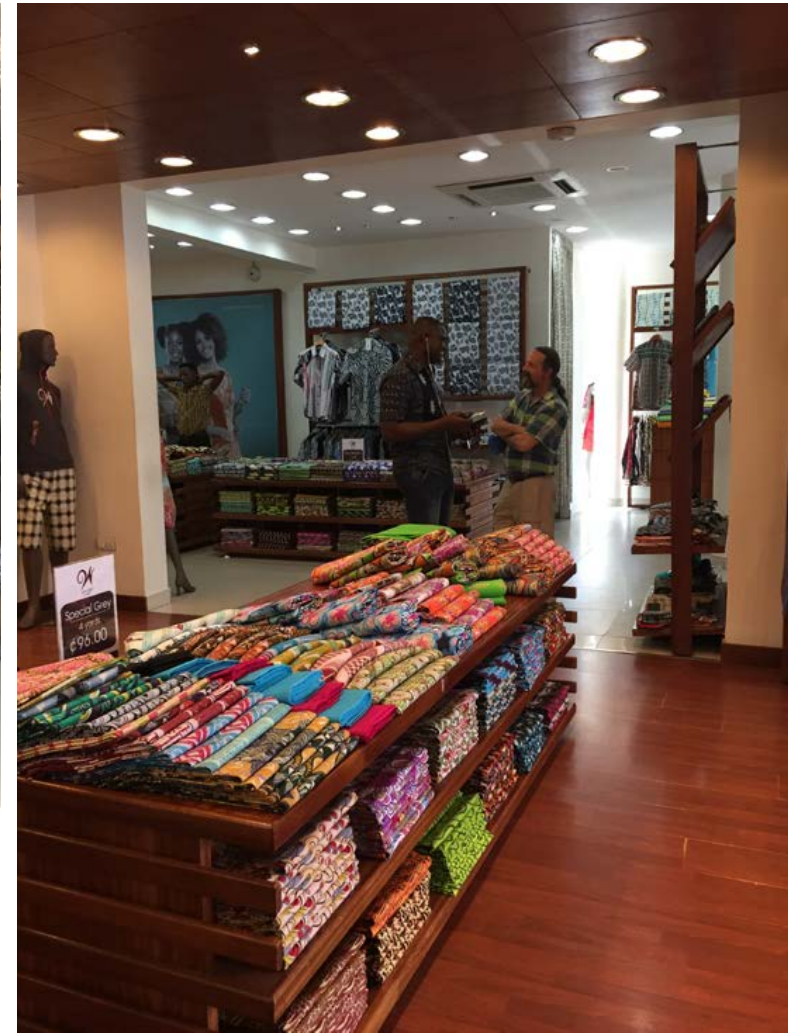


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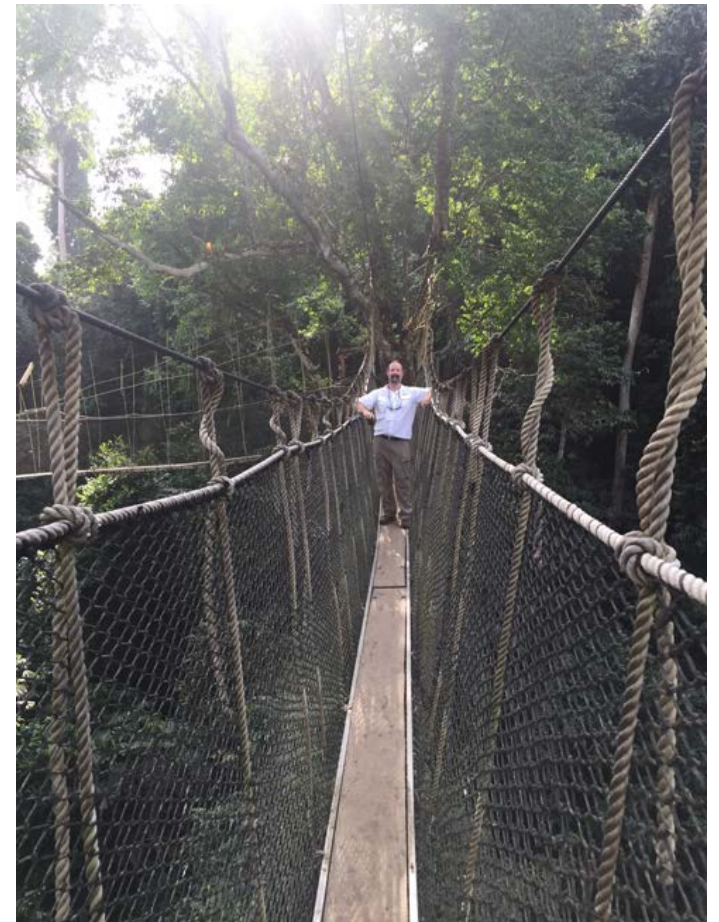




Kakum National Park



Kakum National Park



Kakum National Park

- Ebony (*Diospyros crassiflora*)
- Endemic and endangered in western Africa
- Produces black timber product
- Valued for its durability



Kakum National Park



Ceiba pentandra (Onyina)

MOU with University of Ghana

- No need to have TOEFL exam
- Student exchange
- Biodiversity and climate change studies
- Potential minor in international studies for graduate students



Oiwala don (Thank you in Ga)

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Questions?



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