HONEY AND HONEY BEES OF GUINEA-BISSAU

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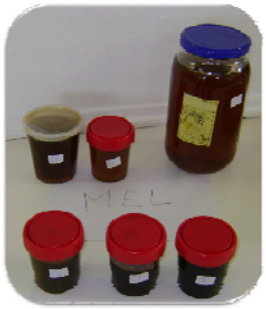
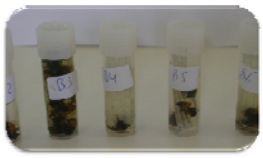
Beekeeping in Guinea – Bissau

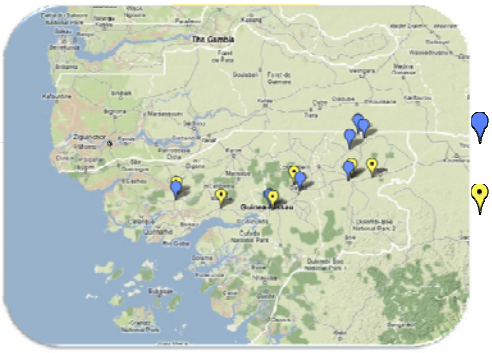
Beekeeping is an ancient activity in Guinea-Bissau. The ancestral interaction with bees stands on "honey hunting" of natural colonies or use of traditional hives hanged on trees. These hives are perfect shelters for swarms but the colony is destroyed every year after honey harvesting. Bees are therefore kept as wild as ever with little, if any, interference from man.

Sampling





Fifteen colonies from 7 different localities were examined for morphometry and mtDNA. Six honey samples were collected from beekeepers using Kenyan top-bar or traditional hives and analyzed for color, humidity, conductivity, free acidity, diastase activity, HMF, total phenols and main sugars using IHC methods.



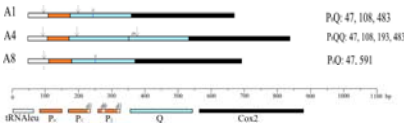
Honey Bee morphometry

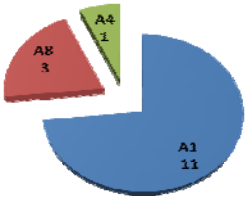
The morphometric analysis showed a bee smaller than the Europeans but with similar leg and wing size. Regarding color, each worker displayed a very distinct yellow spot on thorax and a black spot at the fourth ring, which appeared either isolated from the black strip or linked, looking like a "T shape". Those two features mark the difference towards other honey bees.

Honey Bee Genetics

The mitochondrial DNA analysis was performed using the *Dra*I test (Garnery et al. 1993), which consists in the amplification of the tRNAleu-cox2 intergenic region followed by digestion with the restriction enzyme *Dra*I.

Restriction map and fragment sizes of the tRNAleu-cox2 intergenic region





Three different haplotypes (A1, A4, A8) where detected, all of African ancestry. As found by others for sub-Saharian Africa (Franck et al. 2001), A1 was the most common followed by A8 and A4.

Honey quality

Color	Humidity max. 21	Conductivity max. 800	Free acidity max. 50	Fruct.+ gluc. min. 60	Diastase min. 8	HMF max .40	Total Phenols
Dark amber	16.2%	701 µS.cm^{-1}	33.5 meq.kg^{-1}	72%	41.4 Schade.g^{-1}	19.8 mg kg^{-1}	589 mg GAE.kg^{-1}
	15.9	467	22.9	67	33.0	13.8	532
Dark amber	15.3	302	12.0	60	27.3	10.8	466
Light amber	20.4%	1015 µS.cm^{-1}	32.0 meq.kg^{-1}	77%	22.0 Schade.g^{-1}	98.8 mg.kg^{-1}	1054 mg GAE.kg^{-1}
	20.2	762	23.5	68	21.5	39.6	963
Amber	20.1	622	17.0	60	21.0	7.7	805

References: Franck P, L Garnery, A Loiseau, BP Oldroyd, HR Hepburn, M Solignac, JM Cornuet. 2001. Genetic diversity of the honey bee in Africa: microsatellite and mitochondrial data. Heredity 86:420-430. Garnery L, M Solignac, G Celebrano, J M Cornuet. 1993. A simple test using restricted PCR-amplified mitochondrial DNA to study the genetic structure of Apis mellifera L. Experientia 49:1016-1021. .