



A comparison of conventional bird sampling and new soundscape recording method: A case study from the montane forest of Mt. Cameroon

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Background

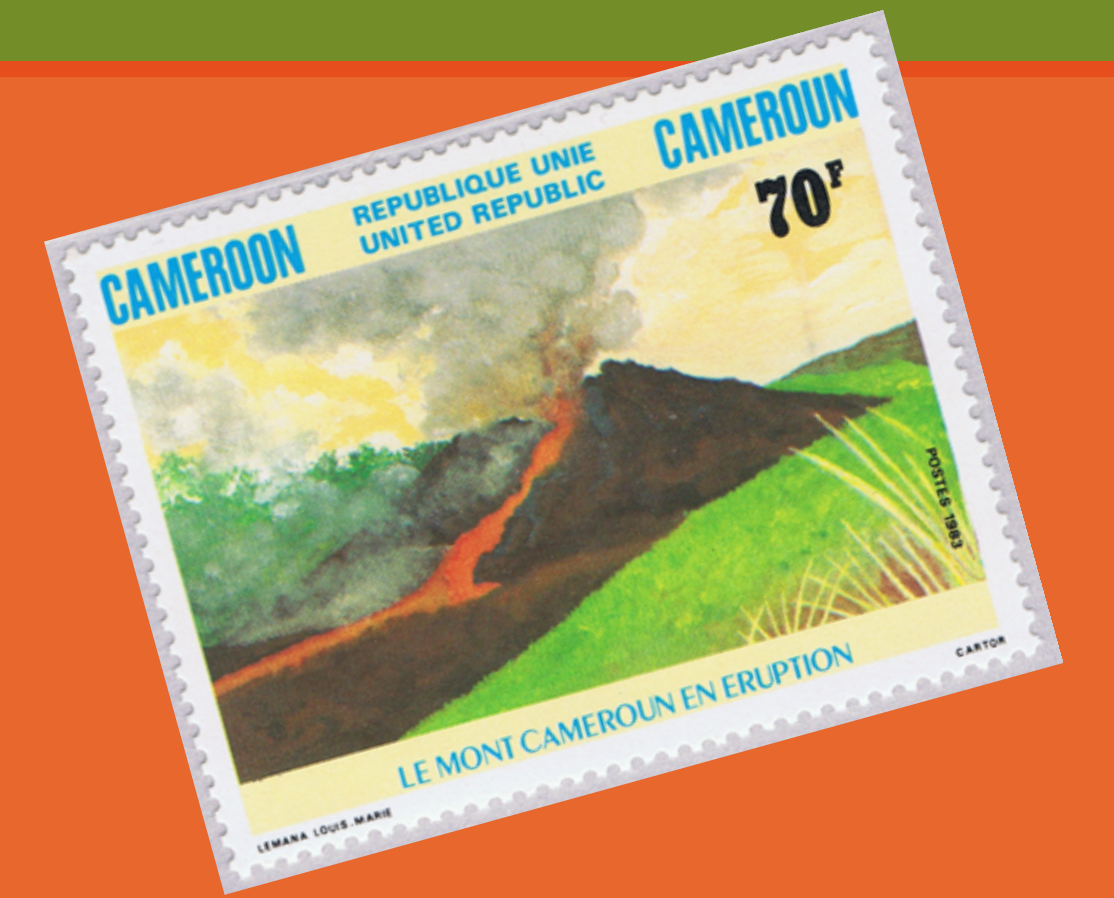
- Sampling of bird communities by traditional methods in the tropics is limited by availability of experts.
- High species richness and low singing rates of birds in the tropics may lead to misidentification or loss of detections during the field sampling.
- There is a need to sample the tropic communities throughout the whole year.
- New bioacoustic approaches based on soundscape recordings offer some solutions for such limitations and provide opportunities for more extensive spatial and temporal sampling.



Point counts with SongMeter attached on a tree

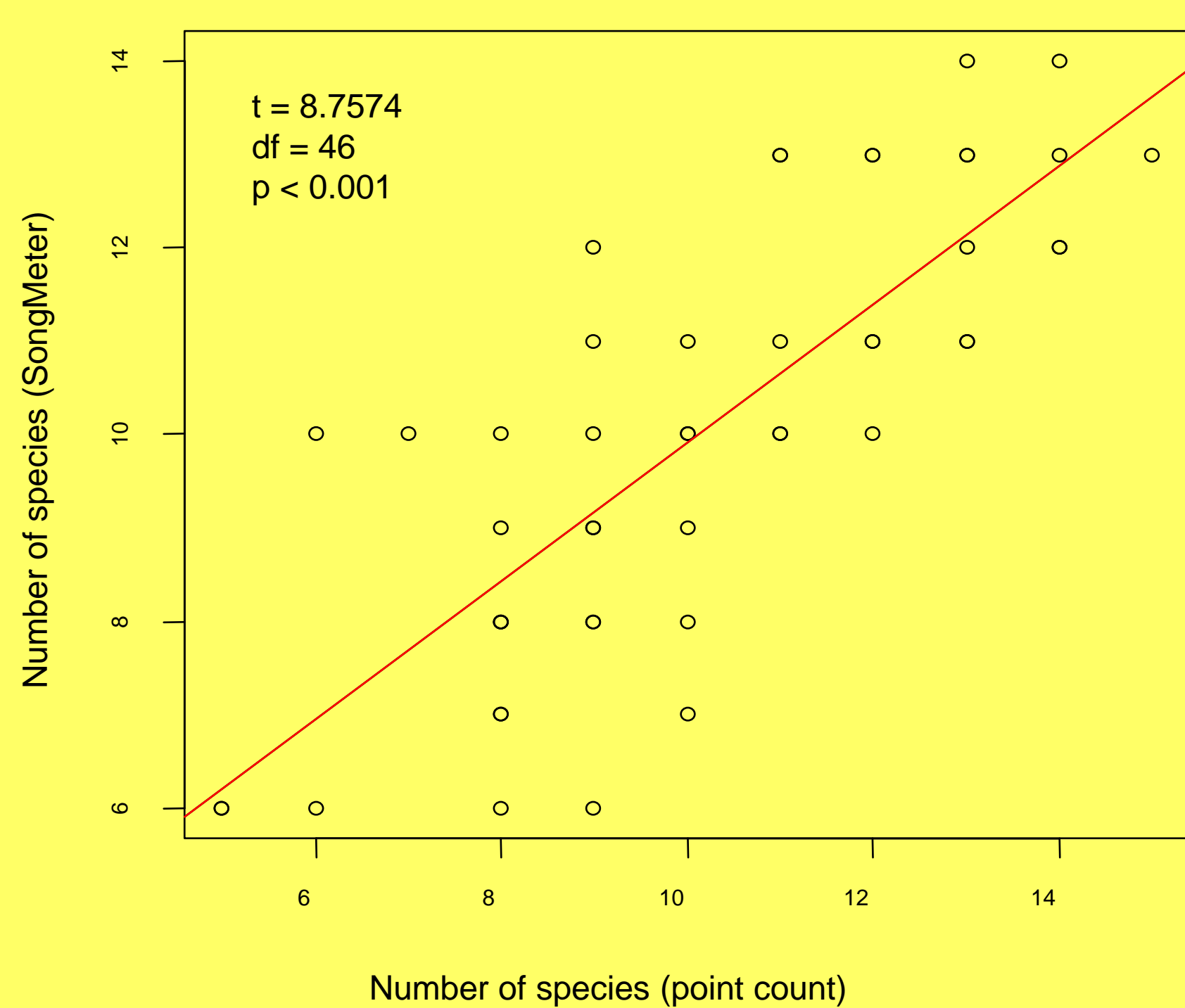
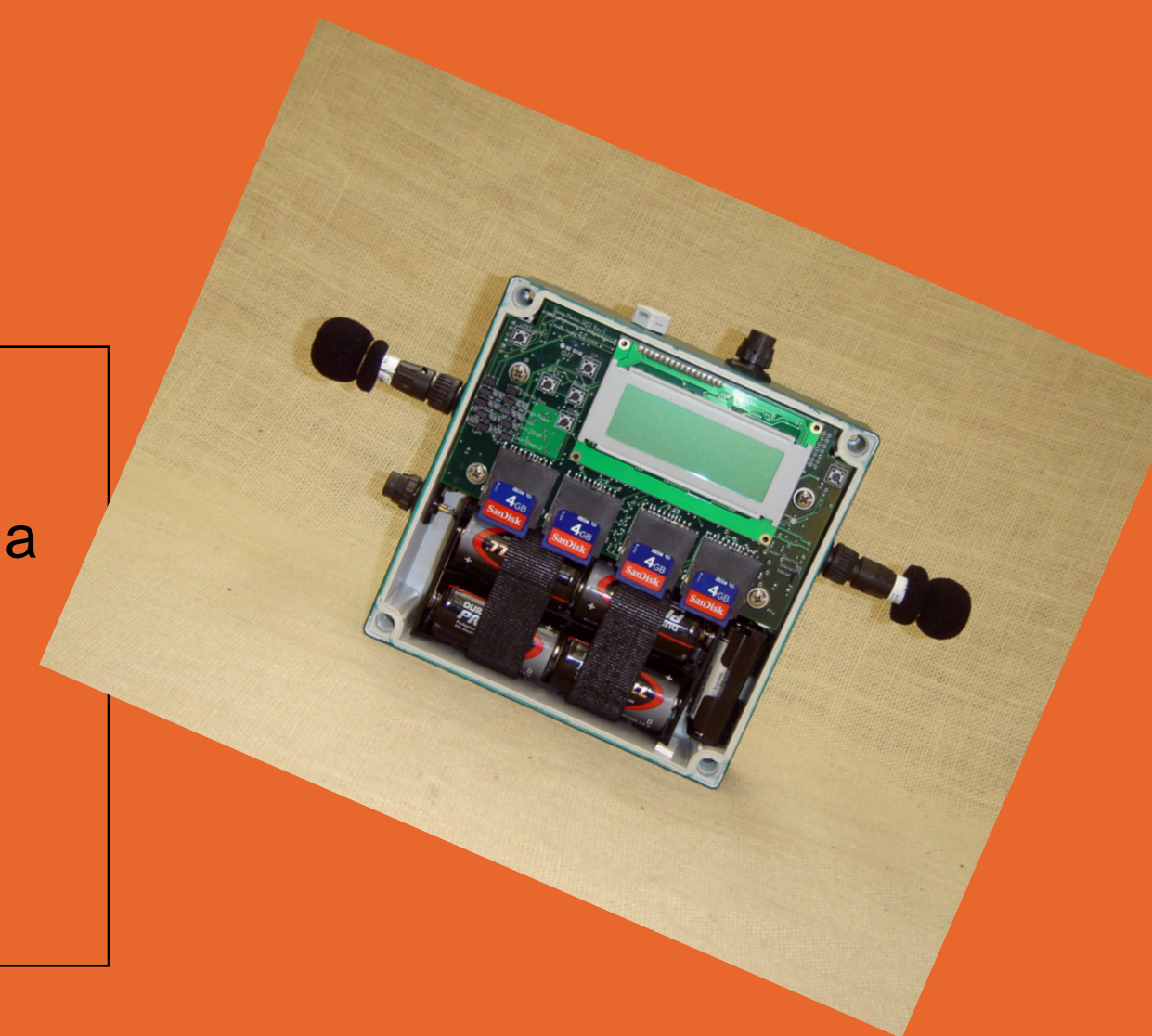
Methods

- primary **montane forest** on **Mt. Cameroon**
- 2200 m a.s.l., beginning of dry season
- 16 points, 3 repeats = **48 samples**
- 15 minutes at each point, within 50 meters
- **point counts** and simultaneous samples obtained by **recording units**
- recording: **SongMeter** (Wildlife Acoustics) with two omnidirectional microphones
- **post hoc "blind" listening** of recordings by expert (OS)
- species checklists, abundance estimation
- birds detected above 50 m in the field were excluded from analyses



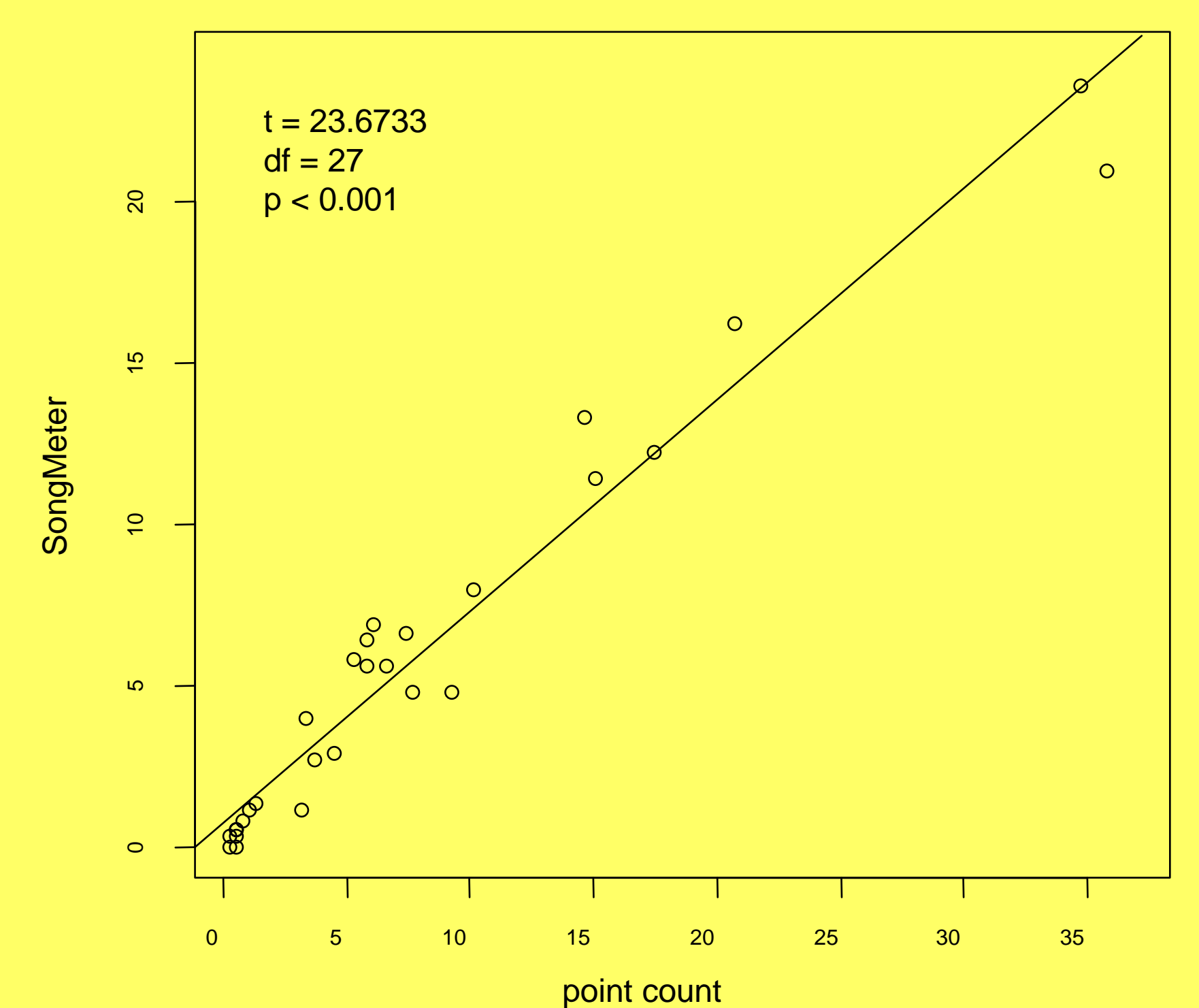
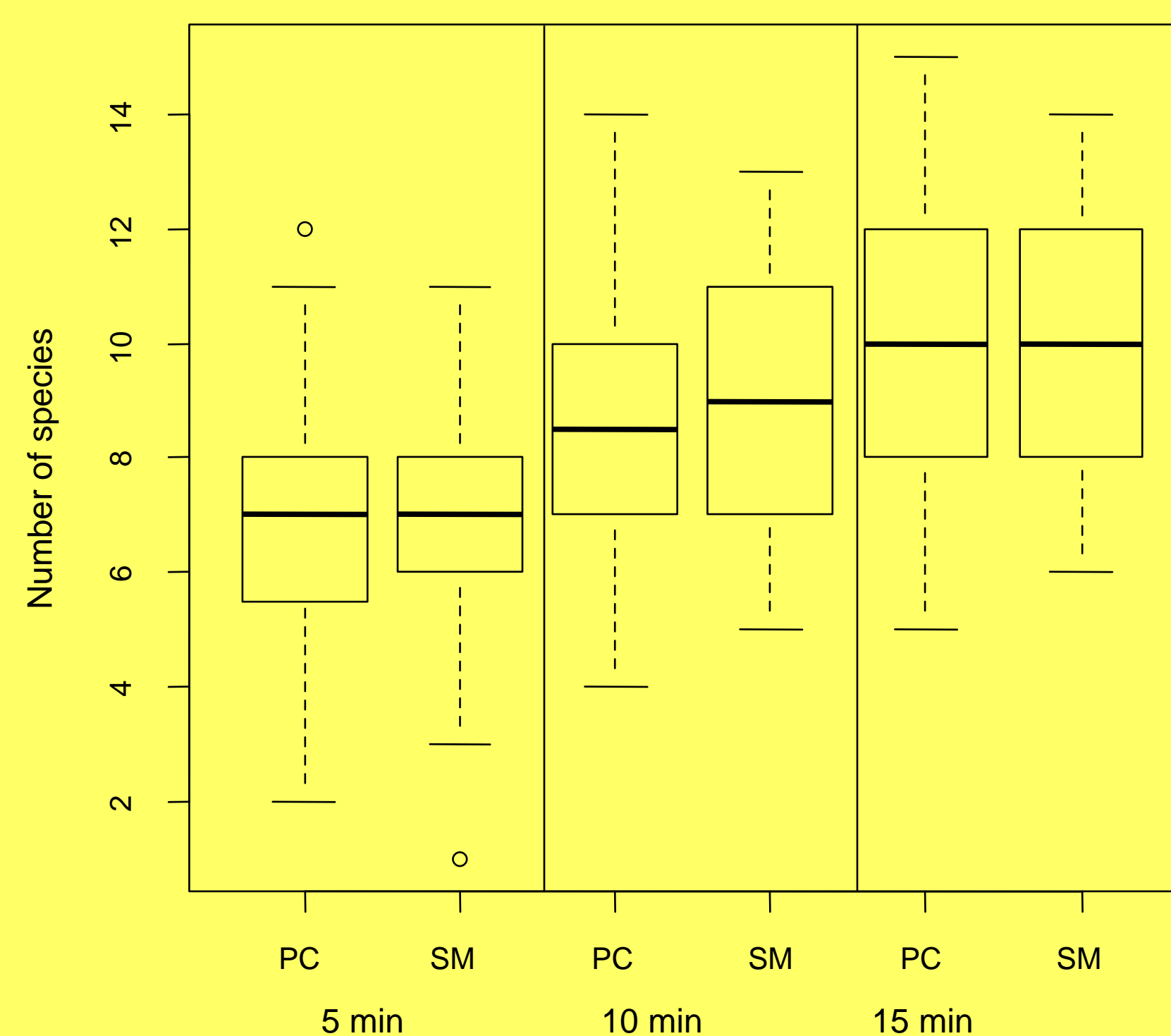
Objectives

- to evaluate reliability of new developed soundscape recording units, with a special regard to tropical rainforest
- to assess the consistence of results on species richness, densities and community composition obtained from point counts and post-hoc listening of recordings

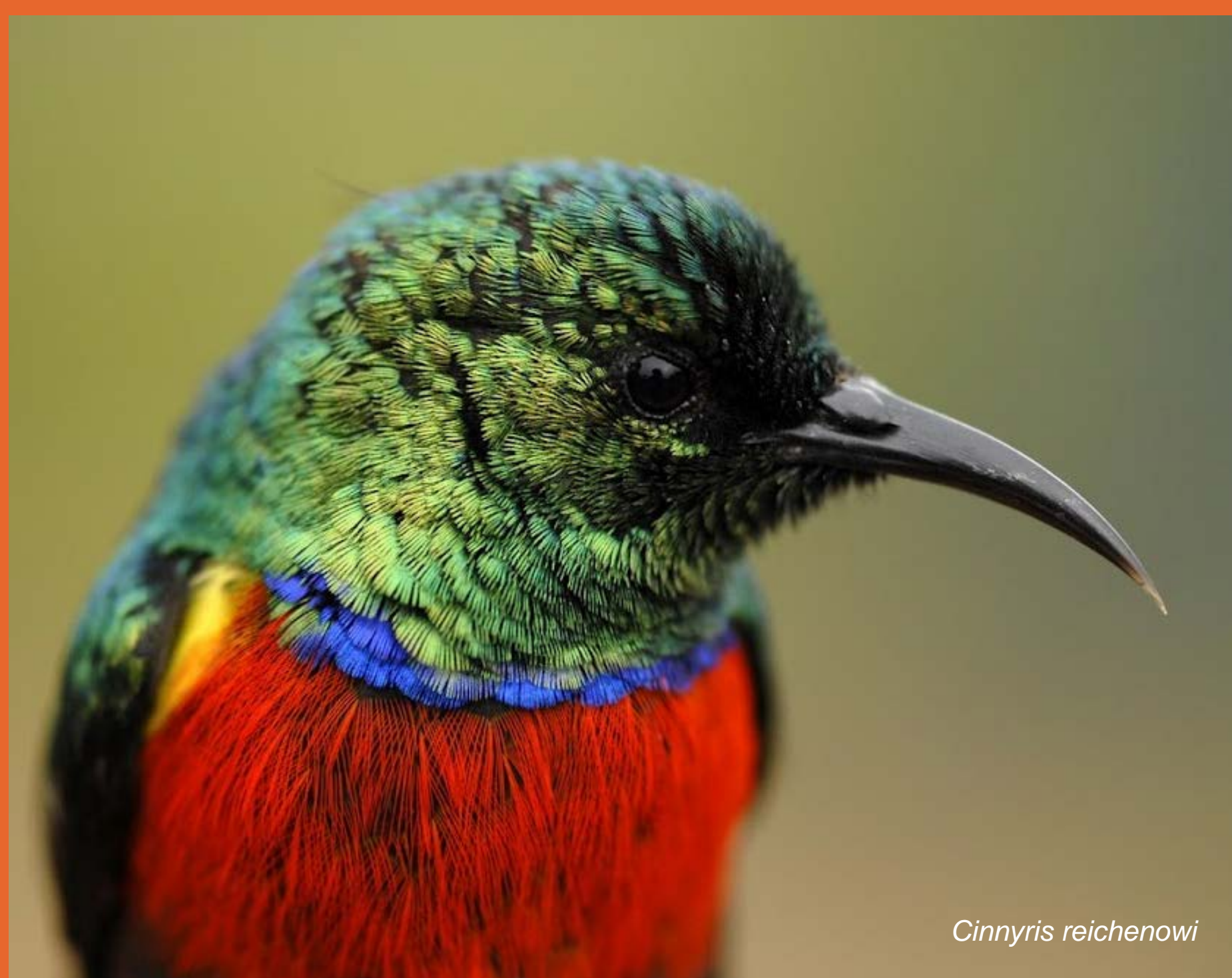


Correlation of species richness of birds at particular sampling sites estimated by conventional point count method and listening of SongMeter recordings.

Cumulative number of species detected by point counts (PC) and listening of SongMeter recordings (SM) during 5 min, 10 min and 15 min. Boxplots show means, interquartile ranges (boxes) and the minimum and maximum of all the data (whiskers).



Correlation of densities of particular species in our study area estimated by conventional point count method and listening of SongMeter recordings.



Cinnerys reichenowi



Lanianus atrolavus

species	number of detections		density (ind./10 ha)		% vocalizing
	point count	songmeter	point count	songmeter	
<i>Andropadus tephrolaemus</i>	48	47	35.8	21.0	98.5
<i>Apalis cinerea</i>	41	42	15.1	11.4	96.5
<i>Bradypterus lopezi</i>	37	40	14.6	13.3	100
<i>Cinnerys reichenowi</i>	47	47	34.7	23.6	100
<i>Cisticola chubbi</i>	26	28	10.1	8.0	100
<i>Columba sjostedti</i>	2	1	0.5	0.3	0
<i>Cossypha isabellae</i>	21	15	7.7	4.8	93.1
<i>Cyanomitra oritis</i>	10	4	3.2	1.1	33.3
<i>Dendropicos ellioti</i>	13	9	3.7	2.7	85.7
<i>Elminia albiventris</i>	19	20	6.6	5.6	92
<i>Indicator willcocksi</i>	5	5	1.3	1.3	100
<i>Kakamega poliothorax</i>	2	2	0.5	0.5	100
<i>Lanianus atrolavus</i>	42	43	17.5	12.2	100
<i>Linurgus olivaceus</i>	15	21	5.3	5.8	100
<i>Muscicapa adusta</i>	15	18	5.8	5.6	72.7
<i>Onychognathus walleri</i>	6	6	9.3	4.8	100
<i>Phylloscopus trochilus</i>	1	1	0.3	0.3	100
<i>Platysteira cyanea</i>	19	22	6.1	6.9	100
<i>Pogoniulus coryphaeus</i>	21	23	5.8	6.4	95.5
<i>Psalidoprocne fuliginosa</i>	1	1	0.5	0.5	0
<i>Pseudoalcippe abyssinica</i>	46	47	20.7	16.2	100
<i>Pycnonotus barbatus</i>	4	4	1.1	1.1	100
<i>Saxicola torquata</i>	3	3	0.8	0.8	100
<i>Serinus burtoni</i>	2	2	0.5	0.5	100
<i>Speirops melanocephalus</i>	7	9	3.4	4.0	100
<i>Tauraco macrorhynchus</i>	2	0	0.5	0.0	0
<i>Turdus pelios</i>	16	11	4.5	2.9	100
<i>Urolais epichlora</i>	21	24	7.4	6.6	100
<i>Ploceus melanogaster</i>	1	0	0.3	0	0

Conclusions

- Most of the individuals detected by point counts vocalized (Table) and were therefore potentially detectable during the listening of SongMeter recordings.
- *Post hoc* listening of SongMeter recordings is comfortable and relatively easy. This method provide similar estimates of bird species richness and densities for both sampling sites and the whole study area.
- Listening of recordings rather underestimate densities of most abundant species.
- The method is less efficient for non-breeding species vocalizing only by short warning calls (e.g. *Cyanomitra oritis*, *Turdus pelios*) or species with silent songs (e.g. *Cossypha isabellae*). However, it is even more efficient for detection of some species, especially those with high-pitched songs (e.g. *Urolais epichlora*, *Linurgus olivaceus*).
- SongMeters are autonomous units that could be easily programmed to record automatically throughout the year.
- Methods of automatic detections of species and species richness from acoustic recordings are gradually developed.



Cisticola chubbi

Do you want to listen to a sample of Song Meter recording from Mt. Cameroon?
Don't hesitate to ask me.

