

Variation in Vocal Repertoires of Wild and Captive Orangutans



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Wild Orangutan Field Sites



★ PhD Fieldwork (2003-2007) ○ Post-doc Fieldwork (2008-2010)

Effects of a Riverine Dispersal Barrier on
Cultural Similarity in Wild Bornean Orangutans
(*Pongo pygmaeus wurmbii*): 2003 - 2007
SUNGAI LADING **TUANAN**



et al., 2010/2012; Labes et al.,
2009; Arora et al., 2010; Slik et al., 2011/2013; Wich et al.,
2012; Bastian & van Schaik in prep

Understanding the Role of Ecology in
Orangutan Reproduction: A Cross-Site
Comparison: 2008 - 2010

In collaboration with TUANAN, SABANGAU, KETAMBE



GUNUNG PALUNG



Comparison of 2 Heavily Logged Peat Swamps

SUNGAI LADING



© Sungai Lading Orangutan Project

- est. by **M. Bastian** April '05
- 200ha, **7.68** indiv/km²

←→
Similar Habitats



TUANAN



© Tuanan Orangutan Project

- est. by **C. van Schaik & M. van Noordwijk** Jan '03
- 945ha, **4.5** indiv/km²

[illegible]

Daily: monitor rainfall & temperature; collect, morphotype & process food samples

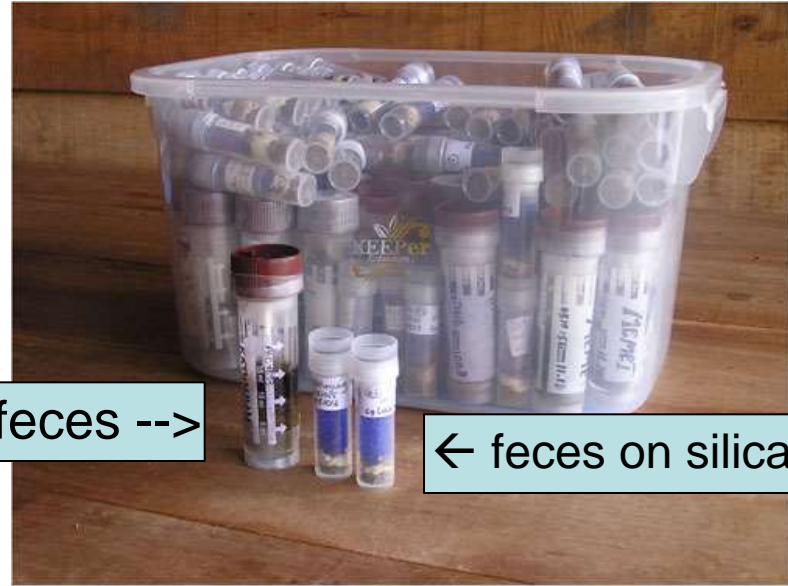
Monthly: monitor fruit, flower & leaf phenology of 1537 trees at SGL, 1599 trees at TU)

One-time: monitor 23 smaller vegetative plots throughout each site

Similar Genetics



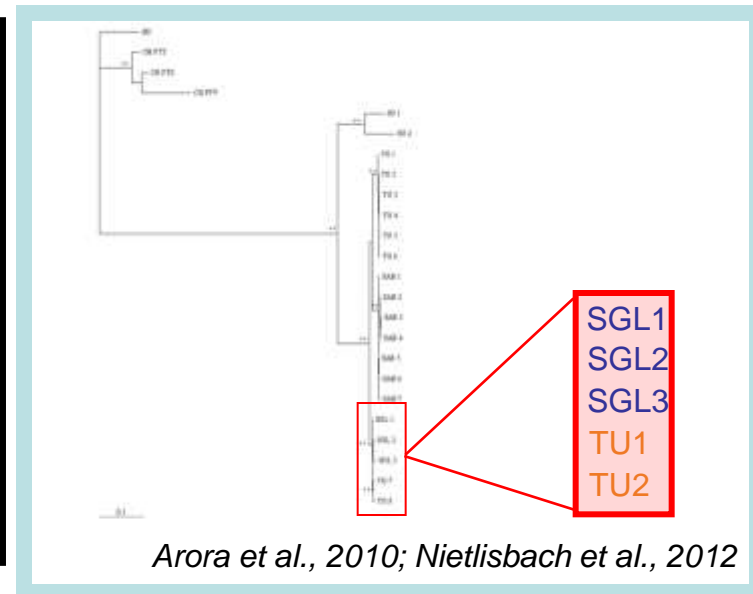
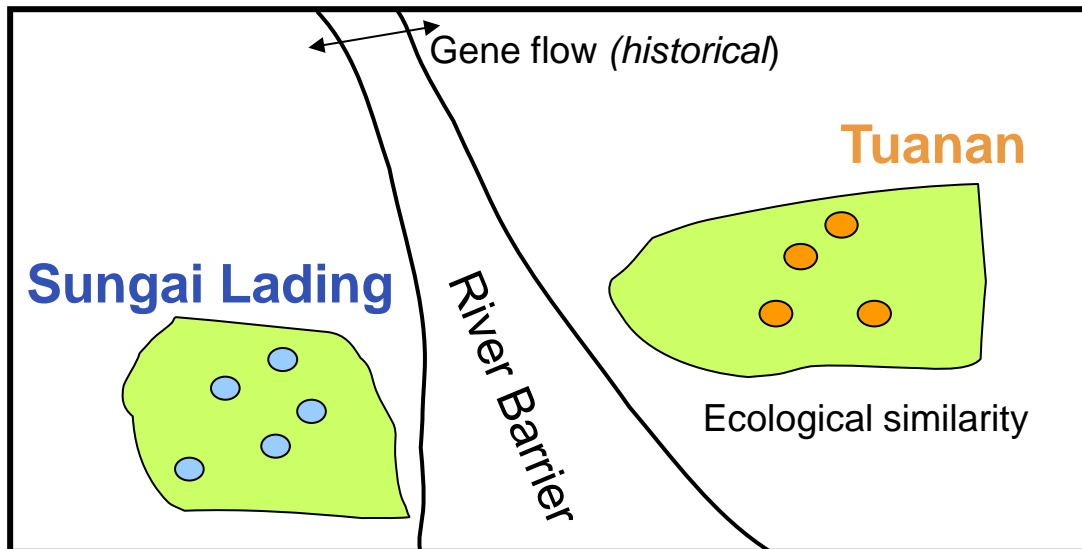
Collecting orangutan feces



feces -->

← feces on silica

Orangutan fecal samples



Known Wild Orangutan Vocalizations

- Ahh
- Ahoor call
- Bared-teeth scream
- Bark
- Complex call
- Contact uff
- Chomp
- Crying and screaming
- Fast long call
- Fear squeak
- Frustration scream
- Gorkum
- Grinding
- Grumble
- Grumph
- Grunt
- Kiss squeak (unaided)
- Kiss squeak (using hand)
- Kiss squeak (using leaves)
- Long call
- Lork
- Mating squeal
- Nest smack
- Play ooh
- Raspberry
- Roar
- Rolling call
- Soft hoot/whimper
- Throatscrape

(Hardus et al., 2009)



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List of fieldsites

The Tuanan Orangutan Research
Project

Standardized field methods

Genetic Sampling Protocol

Hormone Sampling Protocol

Phenology sampling protocol

Orangutan call repertoires

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ORANGUTAN NETWORK

-supporting orangutan field research-

The aim of this site is to support orangutan fieldworkers in their efforts to achieve meaningful comparisons across various orangutan populations and (sub)-species throughout their natural range. In particular, we hope to coordinate and standardize activities so as to describe and evaluate local traditions or cultures.

We also hope that this effort will contribute to effective local conservation through a permanent research presence at active local field sites.



Photo taken by Adriano Lameira



Photo taken by Madeleine Hardus



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Orangutan call repertoires

Examples of orangutan vocalizations and sounds can be heard by clicking on the link under the description. For more information and sonograms see: M.E. Hardus, A.R. Lameira, I. Singleton, H. Morrogh-Bernard, C.D. Knott, M. Ancrenaz, S.S. Utami-Atmoko, S.A. Wich (in press). A Description of the Orangutan Vocal and Sound Repertoire: with a focus on geographical variation. In *Orangutans: Ecology, Evolution, Behaviour and Conservation*. edited by S.A. Wich, S.S. Suci-Atmoko, T.Mitra Setia, C.P.van Schaik. Oxford University Press.

- [Ahh Vocalisation](#)
- [Ahoor Call](#)
- [Bared-teeth scream](#)
- [Bark](#)
- [Chomps](#)
- [Complex calls](#)
- [Contact uff](#)
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- [Fast Long Call](#)
- [Fear squeak](#)
- [Frustration scream](#)
- [Gorkum](#)
- [Grinding](#)
- [Grumble](#)
- [Grumph](#)
- [Grunt](#)
- [Kiss squeak](#)
- [Long call](#)
- [Lork call](#)
- [Mating squeak](#)

Universal Wild Orangutan Vocalizations

- Bared-teeth scream
- Contact uff
- Chomp
- Crying and screaming
- Frustration scream
- Gorkum
- Grumble
- Grumph
- Grunt
- Kiss squeak (unaided)
- Long call
- Roar
- Rolling call
- Soft hoot/whimper

Geographic Variation Within Call Type

Geographic Variation within **LONG CALLS** (*Delgado et al., 2009*)

- Variation in ***acoustic parameters*** between islands – genetic?
call speed/frequency, call duration, number/duration of pulses
- Population-specific responses to habitat differences?



Long Call – (Prime) flanged male “Prabu”, Gunung Palung 2009



Geographic Variation Kiss Squeaks

- Same signal, **arbitrary functions** (*Peters 2001; Lameira et al., 2013*)
GP & TU: **KSQ (unaided)** frequency: (-) related to body size
GP: **KSQ (hands)** rare, **KSQ (leaves)** common, *not* related to body size or perceived threat (opposite at Tuanan)
- 2 populations with **similar habitats/genetics**: (*Bastian et al., 2012*)
TU: **KSQ (leaves)** rare; exhibited by unflanged males, a few flanged males and several adult females
SGL: **KSQ (leaves)** extremely rare; only exhibited by unflanged males





Geographic Variation in Orangutan Calls


(variation in call presence/absence)

- Ahh
- Ahoor call
- Bark
- Complex call
- Fast long call
- Fear squeak
- Grinding
- Kiss squeak (using hand)
- Kiss squeak (using leaves)
- Lork
- Nest smack
- Play ooh
- Raspberry
- Throat scrape



(Hardus et al., 2009; Wich et al., 2012)

Geographic Variation in Orangutan Nest-Related Vocalizations

- Nest smack (TU) 
- Raspberry (Suaq, SAB)
- Grind nest vocalization (SGL)
- Pop vocalization (SGL)

Captive Orangutan Vocal Repertoires

Vocalizations Recorded at Great Ape Trust

(Hardus et al. '09)

- Grumble
- Grumph
- Kiss squeak (unaided)
- Kiss squeak (hand)
- Long call
- Raspberry
- Frustration whine
- Squeak
- Whine

Long-term Vocalization Study at Indianapolis Zoo / European Zoos


(Wich, Lameira, Hardus, Shumaker)

→ Currently ongoing


Goals of Current Study

- Establish consistency of vocalization terminology
- Help caretakers better identify vocalizations

Denver Zoo Orangutan Vocalizations


Kiss squeak (Robin) 

Temper tantrum (Hesty) 


Raspberry (Mias) 

Temper tantrum (Robin) 

Grumble (Mias) 

Funny noise (Robin) 

Long call (Mias) 

Squeaking (Sally) 

Long call (Robin) 

Happy (Mias) 

Fake giggle 

Survey Results

24 Responses:

- Toronto Zoo
- Cameron Park Zoo
- Busch Gardens
- Tampa Bay
- Adelaide Zoo
- Milwaukee County Zoo
- Como Park Zoo & Conservatory
- Tampa's Lowry Park Zoo
- Houston Zoo
- Henry Vilas Zoo
- Zoo Atlanta
- STL Zoo
- Racine Zoo
- Birmingham Zoo
- Hogle Zoo
- Columbus Zoo and Aquarium
- Fort Wayne Children's Zoo
- Chicago Zoological Society
- Topeka Zoo
- Greenville Zoo
- Smithsonian's National Zoo
- Sóstó Zoo
- Philadelphia Zoo
- Fresno Chaffee Zoo

Do any of your orangutans currently make a vocalization that you have not heard previously from them?

- 25% answered Yes
- Comments:
 - Satu-usually would be a kiss squeak but it was a mixture of that and an unusual attempt at a long call possibly? Satu/Bernas-deep throat vocalization Madu-makes noise with her tongue Chantek-makes noise kind of sounds like sucking in air Benny (entertainment ape)-Pig noises and quacks like a duck. Low fast grunts, deep grunts. Blaze-high pitch squeak (playfully manner) Pongo-squeaks Nicky-whistling noise Alan-frequently grunts fast or slow
 - Our Bornean's were making several noises we had not heard from our Sumatran orangutans while in transit and in quarantine, we believe they were stress related and we have not heard them since they came down to the building they live in since they came out of quarantine.
 - Kyle Orangutan learned to blow raspberries and make a sound one to two years ago, possibly a learned behavior from our other male Kiko.

Do you have any orangutans who have changed the context of a specific vocalization?

- 10.71% answered Yes
- Comments:
 - Blaze (adult female) squeaks a lot in many different contexts - but it is always the same vocalization. She uses it as a greeting to keepers and orangutans, but she also uses it when she is nervous or if her infant squeaks to her.
 - Cheyenne SB #1235 has a solicitation vocalization that she would use for food or attention, but in later years has used it to solicit for babies that she was later introduced to for surrogate rearing.
 - Kumang, Female, Studbook #1621, makes a low grumbling noise, to her new infant daughter

Do all of your males long call and how many mature males do you have at your institution?

- 70.37% answered Yes
- Comments:
 - We have 2 males Ben studbook #1671 and Brunei studbook #2431. Ben gives a full long call every few weeks during keeper work hours but may call more frequently than we know. He more often (every few days) starts the long call rumble but doesn't progress into a full long call. Brunei doesn't long call regularly that we know of but he may call early in the morning before the lights in the area go on. Have heard a long call occasionally at this time and have suspected it to be Brunei due to the location of the call.
 - All of our adult males long call - 3 adult males. Chantek, Benny, and Alan. Our juveniles (Bernas -11, Satu, 9) are starting to try and make long calls, but they are not the full call yet.
 - At Denver Robin longs calls very frequently. Mias did not start long calling until a few years ago, when he was around 20 to 22. His are very infrequent and they never really sound complete.
 - Our one male Kluet (A70148) does not long call. He is 18 years old

At what age did your males start long calling?

- Comments:

- Approximately 17-19 years old.
- Kiko started at about 15 (?), Kyle (16 years old) I would not consider his a long call as of yet
- When they got all secondary sexual characteristics; around 14 or 15 years old.
- Approximately 17-19 years old.



Are you able to identify all vocalizations that your orangutans make?

- 64.29% answered Yes



Have you ever had an orangutan learn a new vocalization from a new orangutan?

- **Comments:**

- Blaze tends to squeak alot and now Pongo squeaks, but at a lower pitch.
- Specimen 3112 tried to learn the snorting throat sound from specimen 3209, which he gave when he was scared
- Our female Melati had never to my knowledge made the grumble/squeak during copulation until our new female Tara was introduced and Tara has done this vocalization from the first day of full intros when Tengku was copulating with her frequently
- Our female Mei (in house ID M00709) has begun rasberrying, she learned it from her mate KJ (in house ID M01709), who does it as a begging behavior. They have been housed together since 2009, but only recently did she really start the vocalization as a begging behavior

Please list all of the vocalizations of which you are aware that your orangutans make.

- **Comments:**

- Kiss-squeak, raspberry, long call, grunty foodrumble, submissive squeak, conversational grunts, low and short annoyed rumble followed by yawning
- Kiss squeak -0.2 sometimes with hand Long call 1.0 Crying and screaming 0.1 Frustration scream 0.1 Grumph 0.2 Gorkum 0.2 Grumble 1.0 Play ooh/ahh 0.2 Raspberry 0.2 Squeak 0.2 heard during orangutan play with keepers and orangutans Mating squeals 0.1 breed often but squeal is rare Clacky/clucky 0.1-tongue to roof of mouth and pulled away quickly Piggy-1.0 exhale, different than grumble not as smooth
- Mei - Hoot (anger), Kiss squeak, Raspberry, Meeping (short rapid calling when she is frightened; especially when cornered by her mate) KJ - Long call, Raspberry, Happy Grumbles Mukah - Long Call, Whistle, and "Cookie Monster" (a deep, throaty Roar)
- grumbles, long calls, kiss squeeks, gorkums, grumphs, contact grunts and purrs (flanged male with favorite female keeper in the morning), infant/adolescent screams/whining, raspberries, squeeks (adolescent to dominant male)

Do you have any other interesting comments regarding orangutan vocalizations?

- We have felt lacking in information and consistency in identifying vocalization and meaning. We would really like to have more information on the vocabulary to use with orangutan vocalizations from one institution to the next.
- I recently learned that raspberries are associated with nest building in the wild. Sugi's raspberries are never associated with that. His raspberries begin quietly as an attention seeking noise when he is bored or wants to hang out with you or wants the piece of food that is not intended for him that is in your hand. It then escalates in volume and frequency to mean that he is quite aggravated that he is not getting the attention he wants. It often occurs during training sessions when he is being held at a station and we are working with the girls.
- Bonnie orangutan taught herself to whistle many years ago, published paper by Dr. Serge Wich
- Our group is extremely quiet, we may go days or even weeks without any vocalizations.

Would you be willing to record vocalizations to be analyzed?



Thank You!!!

