The Natural History of Marmosets and Translational Ethology

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Marmoset Natural History

- Evolution and Taxonomy
- Habitat Use
- Sleeping Sites and Pre-retirement Behavior
- Feeding and Foraging Behavior
- Predation Pressures
- Social Behavior
The New World Monkeys

Evolution & Taxonomy

The callitrichids
Some of the 13 species of the genus *Mico*
The members of the genus *Callithrix*
Habitat

Atlantic Coastal Forest
The caatinga

(Amora et al., 2013)
Outside of Rio de Janeiro

Habitat
Feeding and foraging

(Francisco et al. 2014)
Feeding and foraging

(Schiel & Souto, 2016)
(Amora et al., 2014)
Feeding and foraging

(Amora et al., 2013)
The two *Mycocitrus* morphospecies exploited by the *Callithrix flaviceps* group in the RBAR, Espírito Santo, Brazil. Photographs: Frederico Pereira.
Sleeping site selection and pre-retirement behavior

Photo credit A. Karinne
Predation Pressures

Harpia harpyia

Roadside hawk (Rupornis magnirostris)
Predation pressures

Oncilla (*Leopardus tigrinus*)

Ocelot (*L. pardalis*)

Tyra (*Eira barbara*)
C. penicillata juveniles taken by a *Boa constrictor*  
(Teixeira et al., 2016)
Social behavior
Groups of 5-13 closely related individuals

Flexible demographics: monogamous, polyandrous, polygynous

Cooperative breeders: everyone cares for babies

Cohesive spatial patterns and tolerance at feeding sites

Low rates of aggression

Emigrations and immigrations

Territorial

(Schiel & Souto, 2016)
Ethology is the scientific study of animal behavior, usually with a focus on behavior under natural or naturalistic conditions, and viewing behavior as an evolutionarily adaptive trait.

Translational ethology: using our understanding of evolved adaptations to manage primate colonies.
“Marmosets are primitive.”

“Marmosets are more like squirrels or birds than monkeys.”

“Marmosets rely on smell instead of vision.”

“Marmosets aren’t very smart.”

Translational Ethology: Taxonomy and Evolution

Warren, 1965
Translational ethology: feeding and foraging
Translational ethology: habitat use
Translational ethology: Sleeping in captivity
Group-nights sleeping in covered or uncovered sleeping box

51

5
Translational Ethology: Antipredator Behavior
Average duration of visits to the dowel

(Caine & Weldon 1989)
Percent of time spent sniffing

- Series 1
- Series 2
- Series 3
- Series 4
Antipredator behavior
But our monkeys are habituated to us (... aren’t they?)

(Caine, 1990)
Translational Ethology: Social behavior
Take-Away Points

• Marmosets are complex primates that are not "primitive" or "simple" in any way.
• The social, dietary, and habitat adaptability of marmosets is in stark contrast to the notion of a “fragile” species.

• Marmosets’ eclectic diet in the wild lends itself well to enrichment.
• Marmosets are adapted to exploit many different habitats and niches within habitats and thus benefit from varied physical environments in captivity.

• Marmosets are highly vigilant and may see threats through a different lens than humans.
• Marmosets living alone are not marmosets.
The Team

Graduate students
Meg Potter
Michele Petracca
Sarah Neal
Jessie Wombolt
Megan Rice
..and many more

Husbandry staff
Ernie Craven
CRES staff
Sarah Stuck
...and many more

Collaborators
Anthony Rylands
Nick Mundy
Amanda Melin
Paul Weldon
...and others
Fig. 2.1 The distributions of the Jacchus-group marmosets: Callithrix jacchus, C. penicillata, C. kuhlii, C. geoffroyi, C. aurita, and C. flaviceps
Evolution and Taxonomy

[Diagram showing the evolutionary timeline from Ancestral Primate to Humans, with branches for Lemurs, Lorisises and Pottos, Tarsiers, New World Monkeys, Old World Monkeys, Gibbons, Orangutans, Gorillas, Chimpanzees, and Humans.]
Artist’s rendering of *Perupithecus ucayaliensis*
Some of the 12 species of genus *Saguinus*
Predation pressures

Tyra
(Eira barbara)
Percent of visits that included sniffing