



Social Behaviour of Hamadryas Baboons (*Papio hamadryas*) at Auckland Zoo

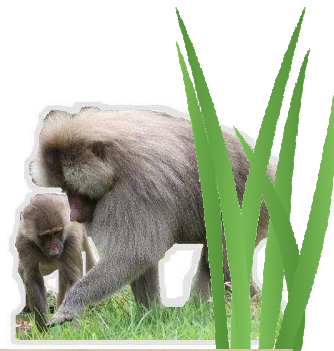
Observing and measuring behaviour at Auckland Zoo.

The content of this activity booklet relates to aspects of **Biology NCEA Level 3:**

- » **AS 91603:** *Demonstrate understanding of the responses of plants and animals to their external environment.*

Derived from the New Zealand Curriculum:

- » **Level 8, Nature of Science:** *Investigating in science and communicating in science.*
- » **Level 8, Living World achievement objective:** *Understand the relationship between organisms and their environment.*



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HAMADRYAS BABOON (*Papio hamadryas*) – General Information Sheet



CLASS: Mammalia

ORDER: Primates

FAMILY: Cercopithecidae

COMMON NAME: Sacred Baboon

The ancient Egyptians considered hamadryas baboons to be the sacred attendants of Thoth, the scribe to the gods.

GENERAL DESCRIPTION: This species exhibits strong sexual dimorphism, especially in body size. Adult males weigh around 21.5kg and females around 9.4kg. Males have a large mantle of hair surrounding their head, neck and shoulders and hairs on the cheeks are lighter forming “whiskers”. Females are olive-brown. Both males and females have pink or red skin surrounding their ischial callosities (rump pads) and males have a similar colour on their muzzle. Females have a muted grey-brown face. The tail is long and curved at the base (not prehensile). Babies are born with a black coat that becomes olive-brown by around six months of age.

RANGE: Occur in north-east Africa principally in Ethiopia. Also found in Saudi Arabia, Somalia and Yemen. Live in the arid sub-desert steppe, alpine grassy meadows and short grass plains or savannah. Their distribution is limited by the availability of watering holes and appropriate sleeping rocks or cliffs.

LOCOMOTION: Baboons walk quadrupedally on the ground and climb up into rocky outcroppings to sleep at night.

DIET IN THE WILD: Baboons are opportunistic omnivores. Seasonally important foods include grasses, roots, tubers, shoots, fruits, leaves and flowers of desert plants, invertebrates and small vertebrates (to a lesser extent). Food resources are generally widely dispersed.

DIET IN THE ZOO: Apples, bananas, carrots, grapes, kumara, silver beet leaves, hard boiled eggs, dog biscuits, grass in the enclosure, browse and other fruits and vegetables at various times (analysed by Zootrition).

REPRODUCTION: Females have an oestrus cycle of 31-35 days. During ovulation, the perineal skin of the female swells. This is a visual signal to males that she is potentially fertile. Gestation lasts about 172 days and females usually give birth to a single offspring. Young are fully dependent for the first few months. Parental care is performed by females. Females nurse, groom and carry their offspring. Males offer protection to infants by keeping control of the one male unit (OMU). Males exclude other males from contact with females and offspring (preventing infanticide). Adult males also maintain vigilance over the group, spotting potential predators. Males are usually very tolerant of infants and juveniles within the OMU and will often play with them or carry them.

LIFESPAN: 35 years in the wild, up to 37 years in captivity.

SOCIAL BEHAVIOUR: Hamadryas baboons are highly social animals that have a complex, four-tier social structure. The basic social unit is a one male unit (OMU). Within an OMU there is a single adult male who mates with one or more (2-11) females (polygynous mating system). The leader male of an OMU aggressively herds or controls the females and offspring of his group. OMUs forage together, travel together and sleep together. In addition to the leader male, there may be a subordinate “follower” male. Two to three OMUs come together to form clans (males thought to be genetic relatives). Clans may forage together. Two or three clans form a single band. When conflicts occur between bands (e.g. at sleeping sites or regarding food) OMU leader males are the primary defenders. Several bands may form a troop that gather together at sleeping cliffs or rocks.

ANIMALS AT AUCKLAND ZOO (as at November 2012):

2 Adult males: Afar (Born at Adelaide Zoo, 2005) and Wasaro (Born at Adelaide Zoo, 2005)

2 Adult females: Ayisha (Born at Wellington Zoo, 2001) and Kito (Born at Wellington Zoo, 2002)

1 Sub-adult male: Yafeu (Born at Auckland Zoo, 2009, son of Ayisha)

1 Juvenile female: Naeemah (Born at Auckland Zoo, 2011, daughter of Kito and Afar)

1 Baby male: Badi (Born at Auckland Zoo, 2012, son of Kito and Afar)

Status in the Wild: Least concern (IUCN – International Union for the Conservation of Nature). These monkeys are threatened by habitat loss, harvesting for food and research and considered crop pests in agricultural areas.

References

Gippoliti, S. & Ehardt, T. 2008. *Papio hamadryas*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. www.iucnredlist.org. Downloaded on 7 November 2012.

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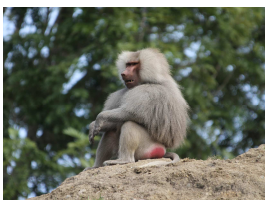


HAMADRYAS BABOON (*Papio hamadryas*) – Social Behaviour Checklist

Hamadryas baboons are highly social and have complex and varied methods of communication. These monkeys use visual signals and gestures, vocalisations and tactile communication. Use the table below to help you interpret what behaviours you see when observing the Hamadryas baboons at Auckland Zoo.

METHODS OF COMMUNICATION:

Vocal communication (sound)	
Two-phase bark: Deep and loud, repeated 2-5 second intervals. Sounds like "wahoo". Given by adult males.	Occurs when a predator is near (particularly a feline) – alarm call . Also heard during inter or intra group aggression between males . Communicates male presence.
Rhythmic grunts: Low and soft. Given by all except infants.	Occurs when one individual is approaching another and signals friendly intentions .
Shrill bark: Single, sharp and explosive. Given by all except adult males.	Alarm signal especially to a sudden disturbance. Group members will flee upon hearing this call.
Auditory cues (hearing/sound)	
Teeth chattering and lipsmacking: Often performed by a dominant animal when another is presenting to him.	Reassuring display.
Visual communication (sight)	
Social presenting: Like presenting, but done by females or juveniles towards higher ranking males. Hindquarters are lower.	Submissive display.
Presenting: Performed by females.	This tells the male she is ready for copulation.
Staring: Eyes are fixed and the eyebrows are raised, scalp moved back and facial skin stretched by moving ears back. Underneath the eyelids are a different colour which contrasts sharply with other facial colours.	Threat display.
Staring with open mouth: Stare and mouth being open but teeth are covered.	Threat display that often occurs with head bobbing.
Head bobbing: Head moves up and down.	Threat display.
Tension yawning: Mouth is fully open to show the canine teeth. Performed by adult males.	Threatening gesture. Occurs when a rival group or a predator is approaching.
Tactile communication (touch)	
Social grooming: When one individual removes parasites and dead skin with their hands from another individual. Leader male is often the focus of grooming by females.	Develop and reinforce social bonds.
Nose to nose greeting: When two individuals meet, they touch noses.	Friendly signal.
Social mounting: Can be a response to social presenting.	Signals friendly reassurance.
Physical aggression: Chasing, biting, slaps.	Agonistic behaviour.



INITIAL OBSERVATION: Hamadryas Baboon (Raw notes – Qualitative data)

Hamadryas baboons live in social groups called a one male unit (OMU). These consist of a leader male, one or more females and offspring. The leader male actively and aggressively herds his females and their offspring preventing them from straying. Groups may also have a “follower” male who forages with the group during the day but he does not interact with the OMU females or offspring. During the day OMUs forage together (often joined by others to form a clan). At night, large troops come together to sleep on rocky outcroppings.

Auckland Zoo currently has two adult males, two adult females, a sub-adult male (not related to either of the adult males), a juvenile female and a male baby. These monkeys are fascinating to observe, highly social and have complex ways of communicating. Use the “Social Behaviour Checklist” sheet to help you work out the group dynamics and social behaviours of the Hamadryas Baboon group at Auckland Zoo. Who is the leader of the OMU? Is there a hierarchy among the females and/or younger members of the group? Which behaviours assert dominance? Which behaviours are submissive? How do the Baboons reassure each other?

Working in pairs or groups of three (share roles of observing, timing and recording data) start by spending 5 minutes watching the baboons to find ways to identify who is who and become more familiar with behaviours and group dynamics. Write any raw notes in the space provided below:



When studying animal behaviour it is important to spend some time observing your study individual or group first. During this time you can become more familiar with the behavioural repertoire of the animal(s), find ways to identify individuals within a group and observe group dynamics.

THE ETHOGRAM (Behaviour Key)

An ethogram in the study of animal behaviour is like a behavioural key. It is a list of all the behaviours displayed by an animal. Defining behaviour takes time!

Species:		Observer(s):
CODE	BEHAVIOUR	DEFINITION
R	Resting	Remaining in a relaxed posture. Eyes may be open or closed.
F	Foraging/ Feeding (describe)	
M	Moving (describe)	
G	Grooming	
V	Vocalisation (describe)	
FE	Facial expression (describe)	
O	Other activity	

BEHAVIOURAL OBSERVATION (Quantitative data collection)

Focal Animal: Time-interval recording

Focal animal sampling is good for recording the behaviour of a particular individual e.g. dominant male.

Record what your focal (chosen) animal is doing every given time period e.g. 30 seconds.

Observer(s):		Date:
Species:		Time:
Individual observed (age/sex/distinguishing features):		
Start time:	Duration:	
Weather:	sunny/overcast/raining	still/breeze/windy hot/warm/cold Temp.
Use your behaviour key to record your chosen animal's behaviour every _____ seconds.		
1	16.	Quick reference behaviour key:
2.	17.	
3.	18.	
4.	19.	
5.	20.	
6.	21.	
7.	22.	
8.	23.	
9.	24.	
10.	25.	
11.	26.	
12.	27.	
13.	28.	
14.	29.	
15.	30.	

Using your data, comment on what you have observed:

Dominance hierarchy (method one)

Spend 5 minutes recording any interactions you see between members of the group. These interactions may be vocal, visual displays, or physical (tactile). Record the events in the table below and interpret the behaviours between individuals as either submissive or dominant based on what happened before and after the behaviour also.

Animals involved	Interaction What happened?	What was the response?	Dominant or submissive?
Animal 1			
Animal 2			
Animal 1			
Animal 2			
Animal 1			
Animal 2			
Animal 1			
Animal 2			

Comment on some of the behaviours you observed.

What does your data suggest about the group structure of Auckland Zoo's Hamadryas Baboons?

Dominance hierarchy (method two)

Spend another 5 minutes recording any interactions you see between members of the group. This time use the table below to record each time there is a 'win' or a 'loss' between group members.

		WINNER							
		Animal 1	Animal 2	Animal 3	Animal 4	Animal 5	Animal 6	Animal 7	Animal 8
LOSER	Animal 1								
	Animal 2								
	Animal 3								
	Animal 4								
	Animal 5								
	Animal 6								
	Animal 7								
	Animal 8								

Comment on what your data suggests about the group structure of Auckland Zoo's Hamadryas Baboons:
 Did you see a **group pattern** or **dominance hierarchy**?

What kinds of behaviours function in keeping this group structure?

DISCUSSION QUESTIONS:

What advantages does living in a group provide for wild Hamadryas baboons?

Where possible refer to the specific group structures of Hamadryas baboons.

Within an OMU, females do not display consistent dominance relationships seen in other species of baboons. However, dominance hierarchies among females can be seen in captive groups.

In wild groups, OMU leader males suppress the aggression between females that could lead to social hierarchies.

Did you observe a hierarchy among the females of the group at Auckland Zoo? **Explain what you observed.**

Females do show some social differences. Some females, called central females spend more time in close proximity to the OMU leader male and have a stronger social bond with him. Females who spend less time with the OMU leader are called peripheral females.

How would being a central female be beneficial?

What risks could a peripheral female face?

Did you see the Baboons grooming each other today? Who was grooming whom?

What happened before or after this time of grooming?

What function do you think grooming provides in a group of Hamadryas baboons?

*How do you think animal behaviour research assists us in conserving species?
How would you like this field of research to contribute to providing a future for primate species?*