

Water-related Activities of a Provisioned Troop of Japanese Macaques (*Macaca fuscata*) in Arashiyama

ニホンザル (*Macaca fuscata*) 餌付け群における水場利用

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Abstract

Humans swim voluntarily. For example, many of us go to the sea when we feel hot. What about the Japanese macaque (*Macaca fuscata*)? In addition, we drink water when we eat food, but is there a similar connection between eating and drinking for the Japanese macaques? To address these questions, I performed fixed-point observations of Japanese macaques around the pond of Arashiyama Monkey Park for three days. I observed their water play, such as paddling through water, swimming, and preventing other macaques from coming out of the water, and the most of these behavior occurred on hot days. These behavior apparently occur to cool their body temperature. In addition, the number of macaques that drank water peaked between 10 to 30 minutes after being fed. This delay in drinking may be because macaques first store their food in their cheek pouches before consumption.

Key words: Japanese macaque, Water play, Water drinking, Interference behavior, Drinking frequency

要旨

われわれヒトは、暑くなれば海に行く、というように、自主的に泳ぐ。では、ニホンザルはどうか。また、ヒトは食事の時に水を飲むが、ニホンザルは採食と水飲みとに関係があるのだろうか。このような観点からニホンザルの行動傾向を調査するため、嵐山モンキーパークの池周辺で3日間、定点観察を行った。その結果、暑い日に集中して泳ぐ、水をかくといった水遊びがみられ、泳いだサルを押さえつけるという行動が見られた。これは水に対する恐れがあるからだと考えられる。また、水飲みでは食事の10分から30分あとに水飲みの回数がピークに達した。これは、サルが頬袋にいったん餌を貯めておいてから食べるからだと推察される。

重要語句: ニホンザル、水遊び、水飲み、妨害行動、水飲みの回数

Introduction

During the summer when the weather is hot, humans (*Homo sapiens*) go to water-filled areas such as the sea, rivers, and swimming pools to

play in the water. We swim to enjoy the cool water and lower our body temperature. In other words, we can say that humans swim voluntarily. However, humans do not possess the innate ability to swim well, and many children do not get close to water at first out of fear. We must also practice to some extent to be able to swim. Hence, we grow to eventually swim voluntarily as our fear of the water gradually diminishes. In addition, we drink water when we are thirsty. We also drink water throughout nearly the entirety of our mealtimes to prevent our mouths from drying out.

What do water play and drinking mean to chimpanzees and gorillas, which are genetically similar to humans (1)? What purpose do these activities serve for these primates? It is unusual to see these ape species swimming because they are not good at swimming (2). Swimming is so unusual for these ape species that it is said that when such an event occurs, an article is written about it. For such reasons, water play by these ape species is not well understood. Since there are few studies on drinking water as well, drinking behavior is not well understood for these ape species either.

The Japanese macaque (*Macaca fuscata*) is a primate species that inhabits Japan. Macaques have been observed to swim and paddle on the surface of water, but there are no detailed reports on specific examples, and the macaque has not been observed jumping into water (2). Water drinking has also been observed but detailed reports are lacking.

The aim of this study was to understand water play by provisioned Japanese macaques in and around a pond. Here, I report observed differences in water play between individuals that swim and those that do not. I also studied their water drinking habits, specifically how drinking is related to location, weather, and feeding, and how often the macaques drank. I discussed the relation between feeding and drinking for the macaques. My findings are intended for comparison with human behavior.

Materials & Methods

I conducted field research at Arashiyama Monkey Park “Iwatayama”, located west of Kyoto City. The target was the Arashiyama E troop of Japanese macaques, comprising seven adult males, 85 adult

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females, and 14 juveniles. On the feeding ground, the park staff feed the macaques three times a day with provisions such as soybeans and chestnuts. Tourists also give food, such as pieces of banana and apple, to the macaques over the fence of a hat.

I observed the macaque troop for three days (Table 1). I performed fixed-point observations around the artificial pond. In order to avoid stimulating the macaques, I avoided unnecessary movement, and observed them using binoculars from several meters away. I recorded the number of macaques belonging to each age-sex class observed around the pond every minute. I also recorded instances of water play and swimming in words as concisely as possible, and also by taking photographs. As for drinking behavior, I recorded the time, place, and age-sex class of the individual.

Table 1. Behavioral observation dates, times, and weather conditions.

Date of observation	Observation time	Weather
16/5/2015	10:41~14:03	Cloudy
30/5/2015	10:00~13:42	Sunny
6/6/2015	09:58~13:30	Rain/Sunny

Results

Water play by macaques was most frequently observed on the hottest and sunniest of the three observation days (Fig. 1). Water play was also most frequently conducted by juvenile macaques (Fig. 2). Furthermore, inter-individual variation in aggressiveness by the macaques was observed when playing in the water, and various actions by the macaques were observed when playing in the water (Table 2). Some

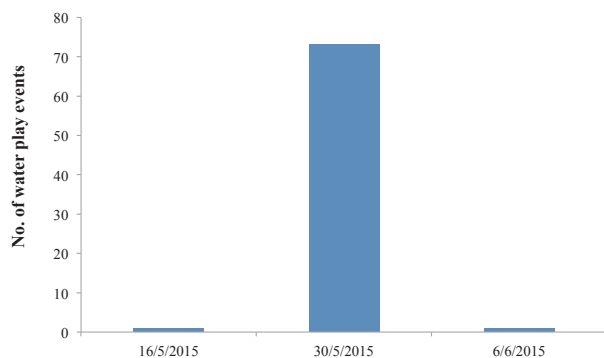


Fig.1. The number of water play events observed on each observation day.

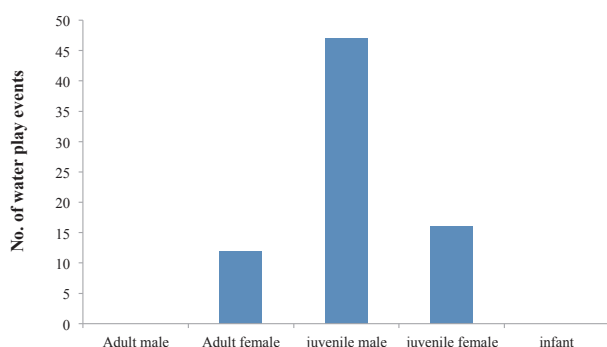


Fig.2. The number of water play events conducted by individuals in each age-sex class.

Table 2. Types of water play and their number of occurrence.

Type of water play	No. of occurrence
Jumping into the water	10
Swimming	15
Paddling the water	34
Touching carp	6
Preventing other swimming macaques from coming out of the water	4
Wrestling	7
Touching floating objects	4

interference actions were observed. On 30th May at 12:54, a two year-old male macaque “A” that rarely swam was seen paddling the water. “A” disturbed another two year-old macaque, “B,” that was emerging from the pond. “A” disturbed not only “B” but also other macaques coming out of the pond after they swam.

Drinking was observed more frequently on the hottest and sunniest observation day (Fig. 3). The frequency of drinking peaked between 10 to 30 minutes after their feeding time. The data obtained on 30th May, however, was different from the data obtained on other days (Figs. 4 and 5). This day showed a different pattern of drinking after feeding at 12:30. Additionally, the frequency of drinking was higher among adult female individuals than among adult males and juveniles (Fig. 6). Drinking sites were almost always fixed at the edge of the pond.

Discussion

I observed that macaques prevented other macaques from coming out of the pond as a pattern of water play. Moreover, it was macaques that were not as active at playing in the water that performed such actions. Fear of water might lead to a desire to disturb a swimming

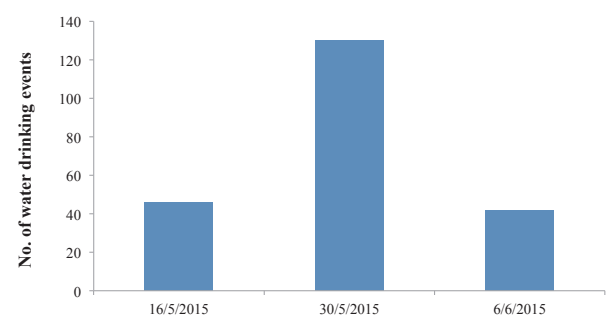


Fig.3. The number of water drinking events on each observation day.

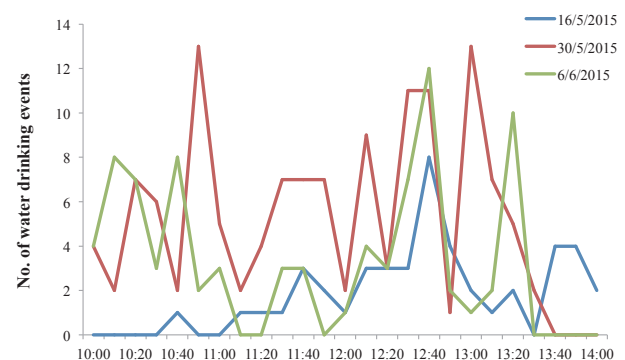


Fig.4. The number of water drinking events over time on each observation day tracked every 10 minutes.

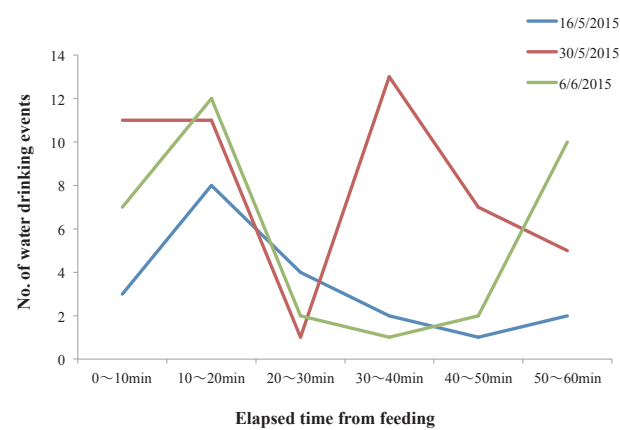


Fig.5. The number of water drinking events over time tracked every 10 minutes after feeding at 12:30 on each observation day.

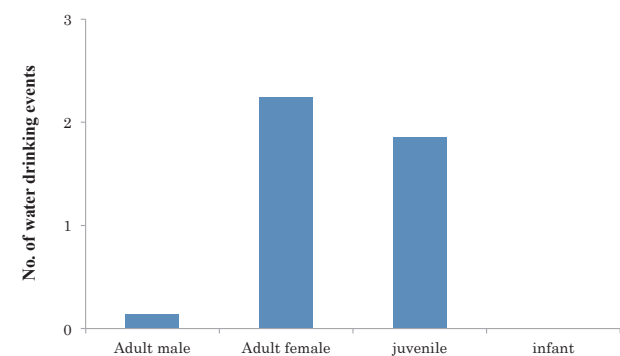


Fig.6. The number of water drinking events by individuals in each age-sex class.

macaque coming out of the pond. Additionally, I observed macaques wrestling in the water in a manner that closely resembled human wrestling. I also observed macaques jumping into the water, which has not been seen before for Japanese macaques. Comparing water play by

Japanese macaques with that of humans, the degree of fear of water was different among juvenile individuals as might be expected with humans. Furthermore, I observed water play on the hottest of the three observation days. This observation does not contradict the fact that humans often swim to cool their body temperature.

The number of macaques that drank water peaked between 10 to 30 minutes after their feeding time. This may be due to the pair of cheek pouches found in Japanese macaques. Japanese macaques temporarily store food in their cheek pouches, and ingest the stored foods after some time has passed (3). This appears to be why the peak time of drinking lags behind the feeding time. Additionally, because the macaques in Arashiyama Monkey Park are fed dry foods, such as soybeans or chestnuts, they are easily rendered thirsty after feeding. Why do adult males and juveniles drink less frequently than adult females? This may be because adult males and juveniles are given juicy foods with high water content, such as bananas, by tourists (Isao Yoshida, personal communication).

Acknowledgements

I would like to thank the following people who helped me carry out this study: Prof. Naofumi Nakagawa, Dr. Eiji Inoue, and Mr. Tatsuhiro Kawazoe of the Laboratory of Human Evolution Studies, Kyoto University, Mr. Shinsuke Asaba and the staffs of Arashiyama Monkey Park “Iwatayama”, and members of the ELCAS Secretariat. Credit is also due to the macaques who made this study possible.

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