

## The Last Possible Troop of Semi-wild Rhesus Macaque (*Macaca mulatta*) in Thailand

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A rhesus macaque, *Macaca mulatta* (Zimmermann, 1780), is one among other 4 macaque species in Thailand, long-tailed or crab-eating macaque (*M. fascicularis*), pig-tailed macaque (*M. nemestrina*), assamese macaque (*M. assamensis*) and stump-tailed macaque (*M. arctoides*). It is distinguished from other macaque species by the characteristics of its tail length, the color of its body, and the pattern of hair on its cheeks. It has a well-haired tail about half the length of the head and body. The upperparts of the body are generally brownish, with the foreparts are grayer. The underparts are paler, and the hind-quarters are reddish brown. The spiral pattern of hair is found on its cheeks (Fig. 1). In 1988, Lekagul and McNeely reported that rhesus macaque is widely found in the northern part of Thailand. It was most common in a variety of habitats: forest, forest edge, mangrove swamps, as well as urban environments such as parks, villages, towns, temples and roadsides (Burton and Eaton, 1995). Recently, the human has invaded those areas, taken out their food resources and disturbed their natural habitats. Killing and eating the macaque monkeys is also common in some areas of Thailand. For these reasons, we now rarely find rhesus macaques in Thailand.

In our field studies on macaque monkeys throughout Thailand during 1988-1997, we did

not find any wild or semi-wild rhesus macaques (Varavudhi et al., 1989a; Varavudhi et al., 1989b; Kawamoto et al., 1993; Varavudhi et al., 1993; Malaivijitnond and Takenaka, 1998), and a report by Aggimarangsee (1992) also confirmed our studies. However, in 1998, we happened to find a troop of semi-wild rhesus macaques at Wat Tham Pa Mak Ho, a Buddhist temple in Amphoe Wang Saphung, Loei Province, north-eastern Thailand. The temple is isolatedly located on the bamboo-forested limestone hill that is surrounded by the agricultural areas (Fig. 2 and 3). Because there has never been any report on the wild or semi-wild rhesus macaques in Thailand since 1988 with the exception of our finding in 1998, the troop of rhesus macaques found at this temple seems to be the only semi-wild population left so far in Thailand. There were 115 macaques in the troop from our last census. Besides their natural diets they could find, they are regularly provided with bananas, rice, peanuts, tamarinds and crackers by the monks and the visitors (Fig. 4).

Nowadays, this semi-wild troop of rhesus macaque may be facing with the problems of hybridization and inbreeding depression. In February 2001, we again surveyed this troop of macaques and found the intruding and later joining of a male pig-tailed macaque that has become an alpha male of the troop since then. Due to the forest destruction that causes the shrinking of natural vegetation and the diminishing of food supply and living space for macaques, pig-tailed macaque is forced to share

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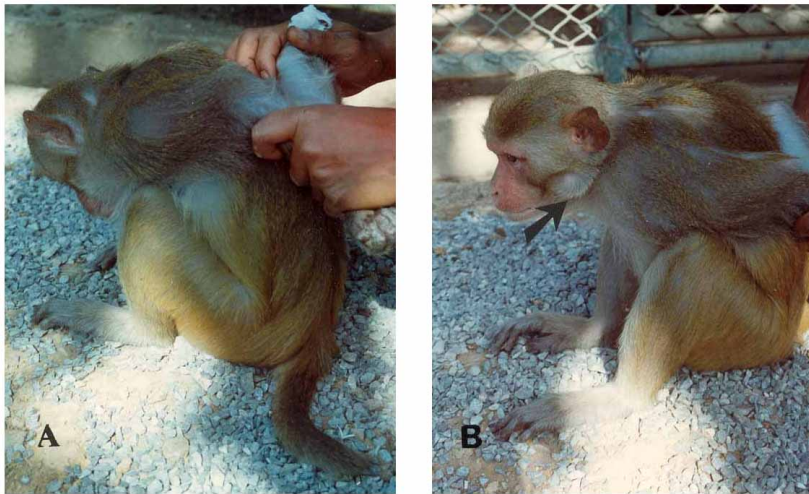


FIGURE 1. The diagnostic features of rhesus macaques: (A) a well-haired tail about half the length of the head and body; hindquarters reddish. (B) the spiraling hair on the cheek area (arrow).

the same habitats with rhesus macaques. Base the mating efficiency of macaque on its social rank, this alpha male pig-tailed macaque may be able to produce a hybrid offspring, because it has a higher opportunity to mate with female rhesus macaques than other male rhesus macaques. Although there are many reports on fertility of a macaque hybrid, no reports have been published on a possibility and fertility of hybrid between rhesus and pig-tailed macaque (Bernstein and Gordon, 1980; Yang and Shi, 1994). Thus, it needs further study in this case. Theoretically, the production of hybrids will decrease the genetic fitness of individuals investing reproductive effort in them since the hybrids will not be able to complete successfully against either parental population. The animal number will possibly be reduced. However, the duration for producing a hybrid between these two macaque species is limited in each year because the rhesus macaques are a seasonal breeder and the breeding season usually occurs between November and July (Michael and Keverne, 1971).

Although the incidence of kin-related mating is rare in free-ranging rhesus macaques (Missakian, 1973), living in isolation from other troops of rhesus macaques at Wat Tham Pa Mak Ho will force them to face with the

problem of inbreeding. There are costs associated with inbreeding because the resultant offspring tend to be homozygous, and the products of rare deleterious genes are thereby expressed (Harvey and Pagel, 1991). The population is finally threatened with extinction through inbreeding. We was documented by the chief monk at Wat Tham Pa Mak Ho that the troop was initiated from only 8 monkeys more than 20 years ago, and the dead of newborn macaques has been happened in these few years.

Since this troop of rhesus macaques may be the last one left in Thailand and since only a few researches on this species in Thailand have been carried out, therefore, we should be fully aware of the conservation of this semi-wild troop of rhesus macaques. Data on genetic diversity and long-term monitoring of the population are considered to be of urgent needs.

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FIGURE 2. Wat Tham Pa Mak Ho, a Buddhist temple in Amphoe Wang Saphung, Loei Province, northeastern Thailand, a habitat of semi-wild rhesus macaques.



FIGURE 3. A rhesus macaque (arrow) on a bamboo tree at Wat Tham Pa Mak Ho.

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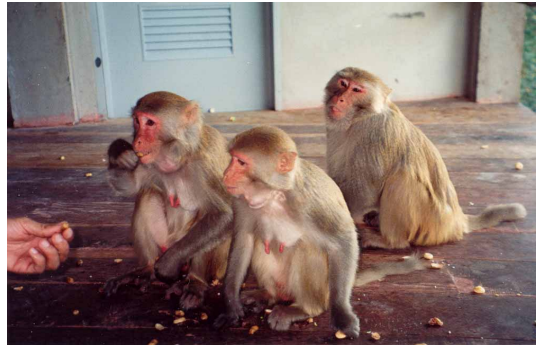


FIGURE 4. Adult female macaques with peanuts fed by the tourists.

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