

## Fish feeding adaptation by Rhesus Macaque *Macaca mulatta* (Cercopithecidae) in the Sundarban mangrove swamps, India

Joydeb Majumder<sup>1</sup>, Rahul Lodh<sup>2</sup> & B.K. Agarwala<sup>3</sup>

<sup>1,2,3</sup>Ecology & biodiversity laboratories, Department of Zoology, Tripura University, Suryamaninagar, west Tripura 799022, India

Email: <sup>1</sup>jmtugemo@gmail.com, <sup>2</sup>samurah@gmail.com, <sup>3</sup>bagarwala00@gmail.com (corresponding author)

Rhesus Macaque *Macaca mulatta* (Cercopithecidae), an old world monkey, is one of the most common primate species found in both forested and human habitation areas. It is diurnal, mostly terrestrial and lives in large multi-male groups. Four subspecies, namely *M. mulatta mulatta* (Zimmermann), *M. m. mcMahonii* (Pocock), *M. m. vestita* (Milne-Edwards), and *M. m. villosa* (True) (Gupta 2001) are reported. It is assessed as Least Concern by IUCN (Timmins et al. 2008). Rhesus Macaques are food generalists and mostly feed on the ground (Gupta 2001). However, forest groups tend to be somewhat more arboreal than nonforest groups. In the tidal swamp forests of the Sundarbans, *M. mulatta* rarely

descend from the trees (Mandal 1964; Mukherjee & Gupta 1965). The natural diet of *M. mulatta* is primarily vegetarian and includes fruits, seeds, flowers, leaves, buds, shoots, twigs, stems, roots, bark, pith, and resin of hundreds of species of angiosperms, gymnosperms, and fungi (Fooden 2000) showing considerable geographical variations (Goldstein & Richard 1989). Lindburg (1971) reported from Dehradun that Rhesus Macaques are largely frugivorous, but occasionally ate termites, grasshoppers, ants, and beetles. Makwana (1979), however, observed that animal food was eaten more often and regularly in Asarori forest and Malik (1983) had observed these monkeys eating bird eggs in Tughlaqabad. Other known animal foods include spiders, crayfish, crabs, shellfish, and honeycombs (Fooden 2000).

Rhesus Macaques studied in the Sundarbans fed on mangrove leaves, fruits, molluscs, and crabs (Mandal 1964). During a trip to the Sundarban mangrove forests in February 2011, we sighted an adult male Rhesus Macaque walking to the bank of estuarine water and catching live fish and eating it (Image 1). The rest of the members of the troop observed it from a distance for about 10 minutes and then two other members of the troop followed the act of the first adult and were successful. This observation on *M. mulatta* suggests that this species is able to feed on a variety of food available to them and, thus, show their high degree of adaptability to a variety of food sources on trees, on



Date of publication (online): 26 April 2012  
Date of publication (print): 26 April 2012  
ISSN 0974-7907 (online) | 0974-7893 (print)

Editor: Mewa Singh

### Manuscript details:

Ms # 02884  
Received 22 July 2011  
Final received 10 October 2011  
Finally accepted 18 February 2012

**Citation:** Majumder, J., R. Lodh & B.K. Agarwala (2012). Fish feeding adaptation by Rhesus Macaque *Macaca mulatta* (Cercopithecidae) in the Sundarban mangrove swamps, India. *Journal of Threatened Taxa* 4(4): 2539–2540.

**Copyright:** © Joydeb Majumder, Rahul Lodh & B.K. Agarwala 2012. Creative Commons Attribution 3.0 Unported License. JoTT allows unrestricted use of this article in any medium for non-profit purposes, reproduction and distribution by providing adequate credit to the authors and the source of publication.

**Acknowledgement:** We are very thankful to Department of CORAL, IIT Kharagpur and entire organizing team of BDCC, 2010 for arranging such a scientific tour to the Sundarban mangrove forest, West Bengal, and we also thankful to forest department of West Bengal for providing us access to the different core areas of Sundarban mangrove forest.

OPEN ACCESS | FREE DOWNLOAD



Image 1. Male Rhesus Macaque *Macaca mulatta* feeding on a fish.

the ground and in water.

Macaques in the coastal forest rely more heavily on high-quality fruits/seeds, which are limited resources but fruit production per tree is higher in the coastal forest (Hanya et al. 2003). As a result, both the population and group density of macaques is about three times higher in the coastal forest (Hanya et al. 2004). As a consequence, there are within and between-group contests for limited food in coastal forests (van Schaik 1989). This could have promoted adaptation to aquatic food in Rhesus Macaques in the Sundarban mangrove swamps.

## REFERENCES

- Fooden, J. (2000).** *Systematic Review of the Rhesus Macaque, Macaca mulatta (Zimmermann 1780)*. Field Museum of Natural History, Chicago, USA, 180pp.
- Goldstein, S.J. & A.F. Richard (1989).** Ecology of Rhesus Macaques (*Macaca mulatta*) in north-west Pakistan. *International Journal of Primatology* 10: 531–567.
- Gupta, A.K. (2001).** Status of primates in Tripura, *Envis Bulletin: Wildlife and Protected Areas* 1(1): 127–135.
- Hanya, G., N. Noma & N. Agetsuma (2003).** Altitudinal and seasonal variations in the diet of Japanese macaques in Yakushima. *Primate* 44: 51–59.
- Hanya, G., S. Yoshihiro, K. Zamma, H. Matsubara, M. Ohtake, R. Kubo, N. Noma, N. Agetsuma & Y. Takahata (2004).** Environmental determinants of the altitudinal variations in relative group densities of Japanese macaques on Yakushima. *Ecological Research* 19: 485–493.
- Lindburg, D.G. (eds.) (1971).** The Rhesus Monkeys in north India: an ecological and behavioural study, pp. 83–104. In: Rosenblum, L.A. (ed.) *Primate Behaviour: Developments in The Field and laboratory Research*. Academic Press, New York.
- Mandal, A.K. (1964).** The behaviour of the Rhesus Monkeys (*Macaca inulatta* Zimmermann) in the Sundarbans. *Journal of the Bengal Natural History Society* 33: 153–165.
- Makwana, S.C. (1979).** Field ecology and behaviour of the Rhesus Macaque (*Macaca mulatta*): II. Food, feeding and drinking in Dehradun forests. *Indian Journal of Forestry* 2: 242–253.
- Malik, I. (1983).** A study of selected behavioural traits of Rhesus monkeys (*Macaca mulatta*) in free-ranging environments. PhD Thesis. University of Meerut.
- Mukherjee, A.K. & S. Gupta (1965).** Habits of the Rhesus Macaque *Macaca mulatta* (Zimmermann) in the Sunderbans, 24-Parganas, West Bengal. *Journal of the Bombay Natural History Society* 62: 145–146.
- Timmins, R.J., M. Richardson, A. Chhangani & L. Yongcheng (2008).** *Macaca mulatta*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 13 April 2012.
- van Schaik, C.P. (eds.) (1989).** The ecology of social relationships amongst female primates, pp. 195–218. In: Standen, V. & R.A. Folley. *Comparative Socioecology*, Blackwell, Oxford.

