Int. J. Adv. Res. Biol. Sci. (2015). 2(12): 228–233

International Journal of Advanced Research in Biological Sciences
ISSN: 2348-8069
www.ijarbs.com
Coden: IJARQG(USA)

Research Article

SOI: http://s-o-i.org/ 1.15/ijarbs-2-12-26

Who grooms more – male or female? Study on provisioned group of Assamese macaque

Prabal Sarkar[1*] and Anindita Bhattacharya[2]

[1]University of Science and Technology, Meghalaya – 7931012
[2]L. N. College, Jharsuguda (Odisha)
*Corresponding author: *prabalsarkarindia@gmail.com*

Abstract

Study was conducted on the provisioned groups of Assamese macaque in order to find out the age and sex variation of grooming interaction. For this, 5 minutes *Scan Sampling* method was followed to study the grooming interactions. Data on the types of grooming behaviour and their age-sex variation, groomer-groomee relationship were also recorded. Study found that females spent more time on grooming interaction in comparison to males irrespective of age classes. This trend was found in all the seasons. This clearly indicates that the supplementary feeding initiates higher agnostic interaction, and the female Assamese macaque spends more time on grooming interaction irrespective of age classes in order to maintain "social bonding" among themselves.

Keywords: Assamese macaque, *Macaca assamensis*, grooming interaction, social bonding.

Introduction

Grooming is one of the most widely used behavior to remove the ectoparasites (Alexander, 1974). It has been argued that grooming behavior is also used as affinitive behaviour among social primates. It helps to establish and maintain close social bonding among the individuals of the group (Carpenter, 1942; Sade, 1965; Kurland, 1977). It has been reported that grooming may also function to win support (Seyfarth, 1977) and to reduce tension (Schino *et al*., 1988).

Grooming behavior has been subjected for long term study in a number of primate species. It has been well studied in several macaque species, both in captivity and in the wild, for example *Rhesus macaque* (Michael and Herbert, 1963; Sade, 1972; Linburg, 1973; Missakian, 1974; Drickamer, 1976; Bernstein *et al*., 1977; Boccia *et al*., 1982; Boccia, 1983, 1986; de Waal, 1984), stump-tailed macaque (Goosen, 1974; Lopez-Vergara *et al*., 1989), *pig-tail macaque* (Boccia, 1989; Boccia*et al*., 1989; Troisi*et al*., 1989); bonnet macaque (Silk, 1982; Boccia, 1989), Long-tailed macaque (Troiso *et al*., 1989), *celebes or crested black macaque* (Hadidian, 1980), Japanese monkey (Furuya, 1957; Oki and Maeda, 1973; Turillazzi *et al*., 1982; Rinaldi, 1985; Mchlman and Chapais, 1988) and *Java monkey* (Troisi and Schino, 1987; Troisi *et al*., 1987).

There is always a subject of study who grooms more than whom. Does there is a sex variation in grooming interaction in primates? Very few studies were conducted on sexual variation of grooming behavior relating to the social fabric in primates. So this paper is aimed to study the sex variation of grooming interaction in provisioned group of Assamese macaque.

Materials and Methodology

The provisioned group was selected from Tukreswari temple in Goalpara of Assam, India. The group when studied had a group size of 64 individuals comprising of 10 adult males, 13 adult females, 3 sub-adult males,

12 young females, 9 juvenile- II, 10 juvenile-I and 7 infants.

A 5 minutes *Scan Sampling* (Altmann, 1974) method was used to study the grooming interactions in the provisioned group of Assamese macaque. Data on the types of grooming behaviour and their age-sex variation, groomer-groomee relationship were recorded.

During data collection, following definitions were used –

Grooming behaviour: Manipulating fur and skin of another individual with finger, mouth and teeth to remove bits of dirt, dead skin, ectoparasites, blood from wounds, etc. (O'Brien, 1993)

Auto-grooming : The groomer is being groomed by itself.

Allo-grooming : The type of the grooming where both groomer and groomee are involved and also two or more individuals may take part.

Rate: Time spent per hour in grooming proximity.

Results

Annual Variation

The age-sex variation of grooming interactions showed a distinct variation of grooming interaction in the provisioned group of Assamese macaque. The adult females showed 65.4 grooming episodes per hour in comparison to 19.3 by adult males. This accounts 3.39 times more grooming interaction by adult females in comparison to adult males. Similar trend also found in sub-adult Assamese macaque. The sub-adult females showed 19.9 grooming episodes per hour in comparison to 3.2 sub-adult males. This accounts 6.2 times more grooming interaction by sub-adult females in comparison to sub-adult males (Fig-1). This indicates that the females of the provisioned group of Assamese macaque spend more time on grooming interaction than the males irrespective of age class.

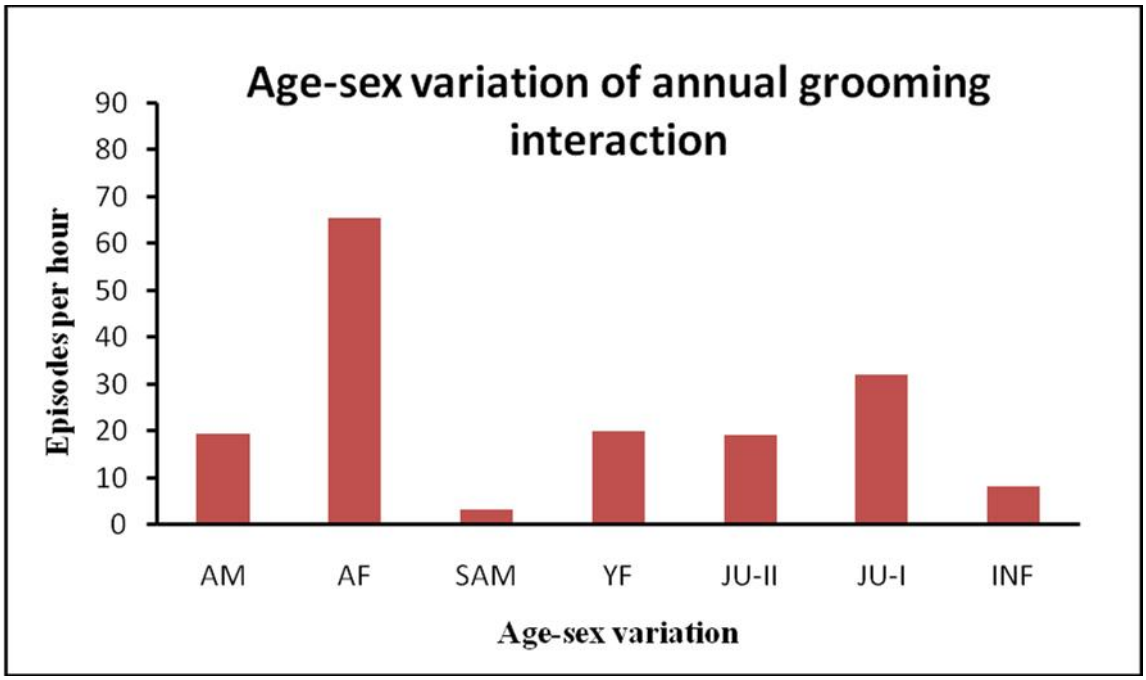

Fig – 1: Age-sex variation of annual grooming interaction in Assamese macaque
AM: Adult male, AF: Adult female, SAM: Sub-adult male, SAF: Sub-adult female, JU-II: Juvenile-II, JU-I: Juvenile-I and INF: Infant

Seasonal Variation

The intra-seasonal variation of grooming also showed almost similar trend as in the annual variation.

(a) Monsoon

The adult females of the provisioned group of Assamese macaque showed about 82.4 grooming episodes per hour in comparison to 16.6 episodes by adult males in monsoon. This accounts 4.95 times more grooming interaction by the females in comparison to adult males. Similarly, the sub-adult females also showed 14.14 grooming episodes per hour in comparison to 2.7 episodes by sub-adult males. This accounts about 5.2 times more grooming

interaction by sub-adult females in comparison to sub-adult males (Fig-2). This clearly indicates that females irrespective of age spend more time on grooming interaction than males during monsoon.

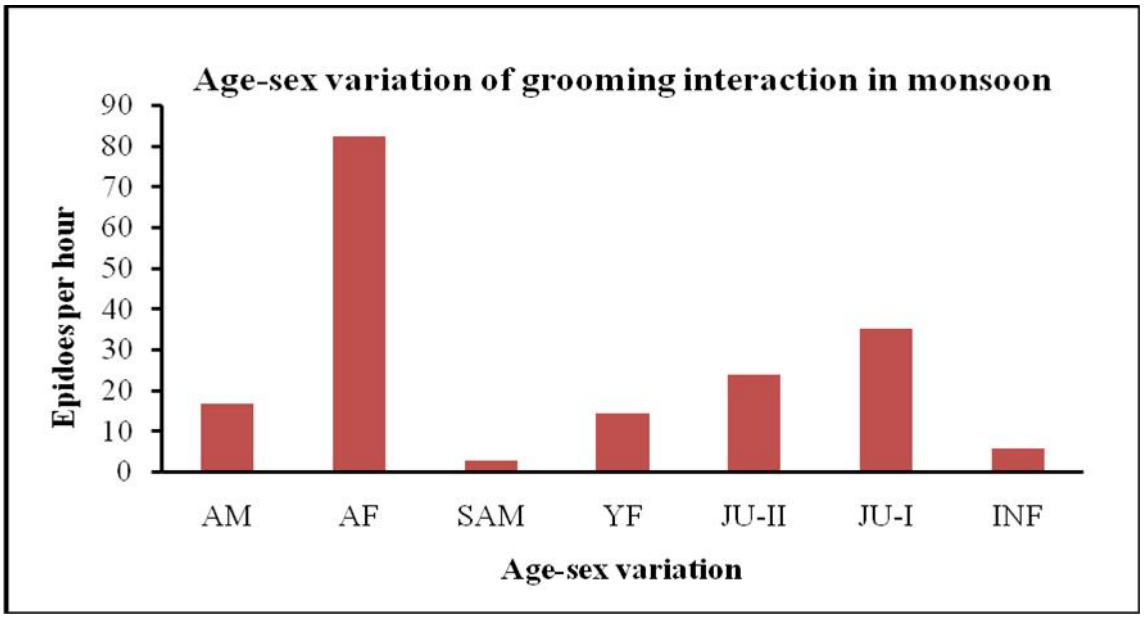

Fig – 2: Age-sex variation of grooming interaction of Assamese macaque in monsoon

(b) Re-treating monsoon

During re-treating monsoon, about 80.36 grooming episodes per hour by adult females was recorded in comparison to 14.7 episodes by adult males. This accounts about 5.47 times more grooming interaction by adult females in comparison to adult males. Similarly, about 22.7 grooming episodes per hour by sub-adult females were recorded during re-treating monsoon in comparison to 3.1 episodes by sub-adult males. This accounts 7.3 times more interaction by sub-adult females in comparison to sub-adult males (Fig-3). This clearly indicates that females spend more time on grooming interaction than males in re-treating monsoon irrespective of age class.

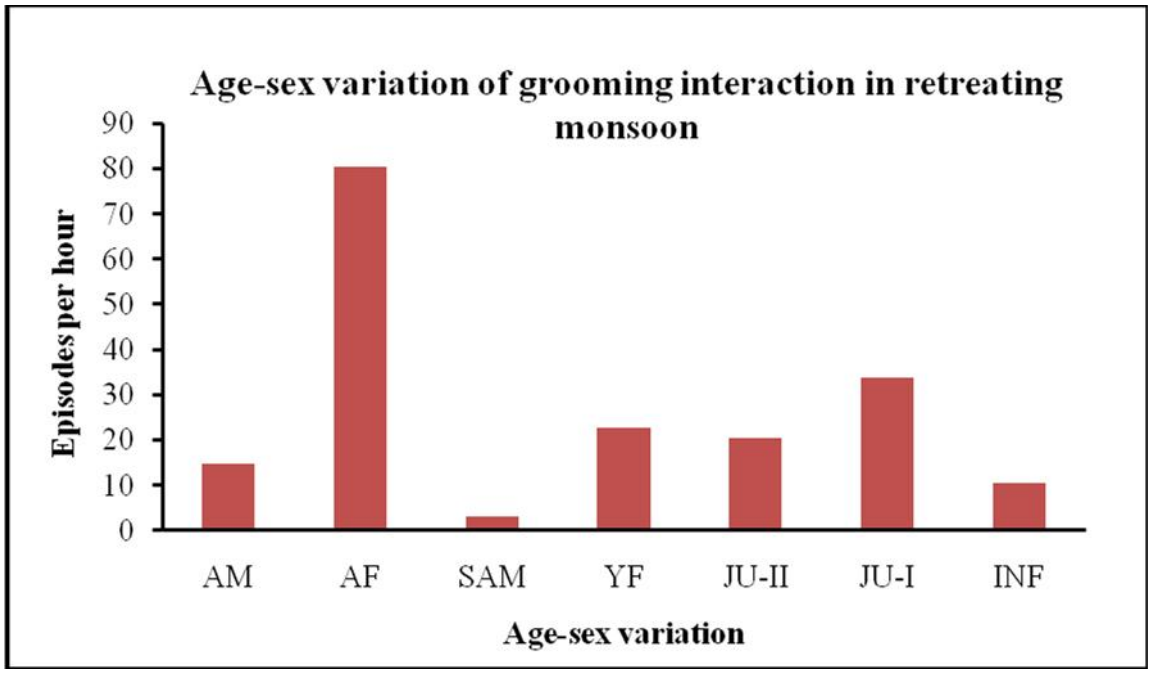

Fig – 3: Age-sex variation of grooming interaction of Assamese macaque in retreating monsoon

(c) Winter

The adult females of the provisioned group of Assamese macaque showed about 65.77 grooming episodes per hour in comparison to 28.3 episodes by adult males during winter. This accounts about 2.3 times more grooming interaction by the females than the adult males. Similarly, the sub-adult females showed 29.97 grooming episodes per hour in comparison to 3.6 episodes by sub-adult males. This accounts about 8.26 times more grooming interaction by sub-adult females in comparison to sub-adult males (Fig-4). This indicates that the females also spend more time on grooming interaction than males during winter irrespective of different age class.

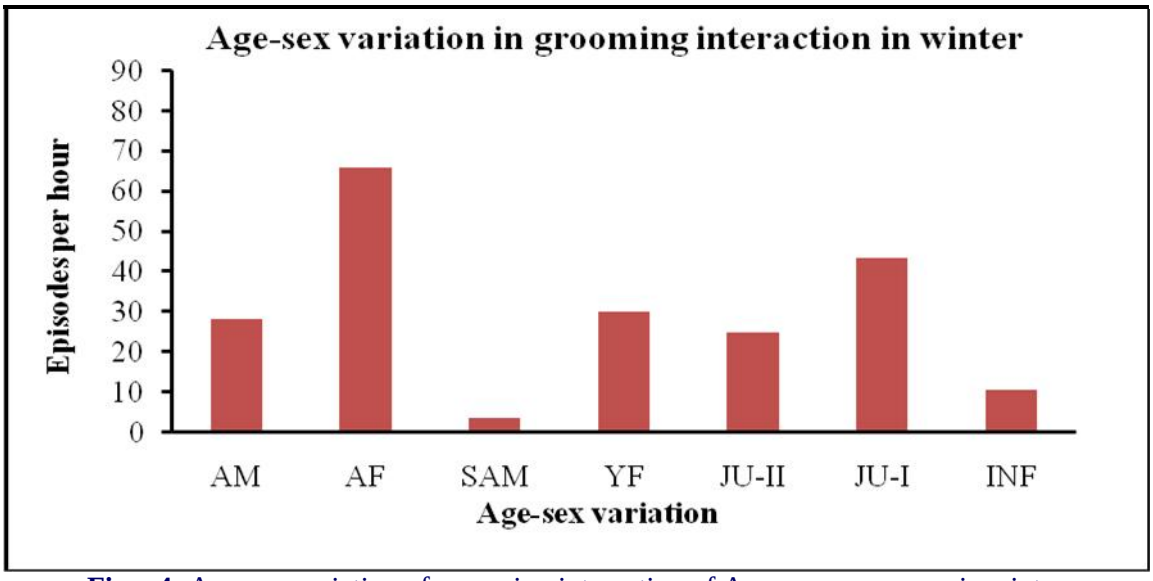

Fig – 4: Age-sex variation of grooming interaction of Assamese macaque in winter

(d) Pre-monsoon

In pre-monsoon, similar trend was also recorded. The adult females showed 33.05 grooming episodes per hour in comparison to 17.44 episodes by adult males. This accounts about 1.89 times more grooming interaction by adult females in comparison to adult males. Similarly, the sub-adult females showed about 12.64 grooming episodes per hour in comparison to 3.35 episodes by sub-adult males. This accounts about 3.77 times more grooming interaction by sub-adult females in comparison to sub-adult males (Fig-5). This clearly indicates that females spend more time on grooming interaction than males irrespective of age class.

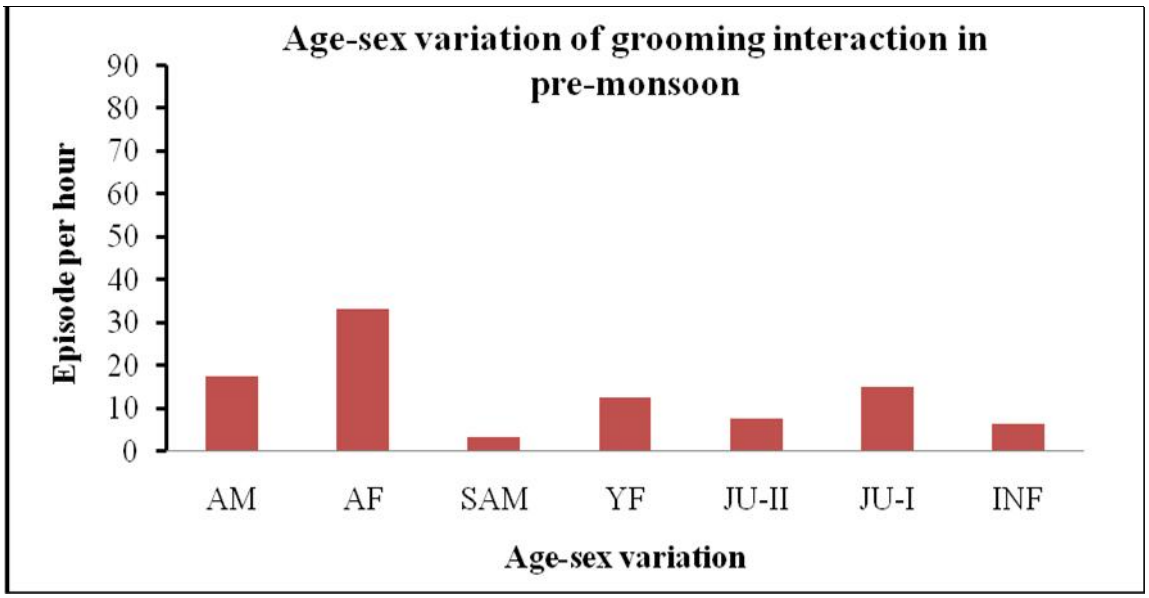

Fig – 5: Age-sex variation of grooming interaction of Assamese macaque in pre-monsoon

Discussion

A relationship between aggressive interaction and distribution of food resources has already been established in primate. The feeding on provisioned food may result into higher rate of aggressive interaction. This is because; the clumped food resource reduces the inter-individual distance (proximity). Thus it increases the probability of physical contact which results in higher tension and agonistic interaction.

The higher frequency of grooming interaction in the provisioned group compared to forest group suggests relationship of grooming behaviour with food distribution (Sarkar, 2014). This trend holds true for all the categories of age classes for both males and females. It is worth mentioning here that the time saved from the expensive foraging activity (searching, finding and obtaining food) due to provisioning is invested on higher grooming interactions. Therefore, the primary function of grooming in provisioned group may be to reduce tension. The total time spends on grooming, the proximity factor and nature of food distribution and its proportion in their diet are in general agreement with the "*tension reduction mechanism*" hypothesis. Since male holds all the resources, it is the female who must maintain a good relationship with the high ranking males in order to access the food resource. Since females play a major role in maintaining social boding, they spend more time on grooming interaction in order to reduce social tension with the male members of the group. Hence a higher frequency of provisioning must increase the frequency of grooming interaction among females in order to reduce inter-individual tension and for stabilizing the primate social system. Otherwise, higher aggression in the provisioned group is supposed to fracture the social setup leading to the formation of new sub-groups. But, in reality, the grooming factor plays a very significant and crucial role to keep the "*social fabric*" intact, which is a survival need attained through evolution.

Acknowledgments

Our gratitude and special thanks to Prof. S.M. Mohnot, Prof. P.C. Bhattacharjee, Dr. Arun Srivastava, Prof. I. S. Bernstein, Prof. Charles H. Southwick, Dr. David Ferguson and Dr. R. Horwich for their technical help during this study. Special thank also goes Dr. Dilip Chetry, Dr. Joydeep Bose, Ms. Farzana Begum, Dr. Jayanta Das, Dr. Jihosuo Biswas, Dr. Rekha Medhi, Dr. Anil Chhangani and Dr. Mathew Kooper.

This study was part of the grant received from U.S. Fish and Wildlife Service (Grant No. INT/FWS-22).

References

Alaxander, R. 1974. The evolution of animal behavior. *Ann. Rev. Ecol. System*. 5: 325-383.

Altmann J. 1974. Observational study of behavior sampling methods. *Behaviour* 49: 227-267.

Bernstein, I.S., Rose, R.M. and Gordon, T.P. 1977. Behavioural and hormonal responses of male rhesus monkeys introduced to females in the breeding and non breeding season. *Anim. Behav*. 25: 609-614.

Boccia, M.L. 1983. A functional analysis of social grooming patterns through direct comparison with self-grooming in rhesus monkeys. *Int. J. Primatol*. 4: 399-418.

Boccia, M.L. 1986. Grooming site preferences as a form of tactile communication and their role in the social relations of rhesus monkeys. In :*Current Perspectives in Primate Social Dynamics* (ed. by Taub. D. M. and F. A. King), Van No strand Reinhold, New York, 505-518.

Boccia, M.L. 1989. Comparison of the physical characteristics of grooming in two species of macaques (*Macaca nemestrina* and *M. radiata*). *J. Comp. Psychol*. 103 : 177-183.

Boccia, M.L., Rockwood, B. and Novack, M. 1982. The influence of behavioral context and social characteristics on the physical aspects of social grooming in rhesus monkeys. *Int. J. Primatol.* 3: 91-108.

Boccia, M.L., Reite, M. and Laudenslager, M. 1989. On the physiology of grooming in a pigtail macaque. *Phys. Behav*. 43: 667-670.

Carpenter, C.R. 1942. Sexual behaviour of free ranging rhesus monkeys *Macaca mulatta*. *J. Comp. Psychol*. 33: 113-142.

de Waal F.B.M. 1984. Coping with social tension: sex differences in the effect of food provision to small rhesus monkey group. *Animal Behaviour* 32: 765-773.

Drickamer, L.C. 1976. Quantitative observations of grooming behaviour in free-ranging *Macaca mulatta*. *Primates* 17: 323-335.

Furuya, Y. 1957. Grooming behaviour in the wild Japanese monkeys. *Primates* 1: 47-68.

Goosen, C. 1974. Some causal factors in autogrooming behaviour of adult stump-tailed macaques (*Macaca arctoides*). *Behaviour* 49: 45-63.

Hadidian, J. 1980. Yawning in an old world monkey *Macaca nigra* (Primates: Cercopithecidae). *Behaviour* 75: 133-147.

Kurland, J.A. 1977. Kin selection in the Japanese monkey. *Contribution to Primatology* 12 : 1-145.

Lindburg, D.G. 1973. Grooming behavior as a regulator of social interactions in rhesus monkeys. In :*Behavioral Regulators of Behavior in Primates* (ed. by Carpenter C.R.), Buckwell University Press, Lewisburg, PA. 124-148.

Lopez-Vergara, L., Santillan-Doherty, A.M., Mayagoitia, L. and Mondragon-Ceballos, R. 1989. Self and social grooming in stump-tailed macaques: Effects of kin presence or absence within the group. *Behav. Proc.*18: 99-106.

Mchlman, P.T. and Chapais, B. 1988. Differential effects of kinship, dominance, and the mating season on female allogrooming in a captive group of *Macaca fuscata*. *Primates* 29: 195-217.

Michael, R.P. and Herbert, J. 1963. Menstrual cycle influences grooming behavior and sexual activity in the rhesus monkey. *Science* 140: 500-501.

Missakian, E.A. 1974. Mother-offspring grooming relations in rhesus monkeys. *Arch. Sex. Behav.*3: 31-40.

Oki, J. and Maeda, Y. 1973. Grooming as a regulator of behavior in Japanese macaques. In :*Behavioral Regulators of Behavior in Primates* (ed. by Carpenter C.R.), Buckness University Press, Lewisburg, PA. 249-163.

Rinaldi, F. 1985. *Attivita' di spostamentodel Macaco del Giappone (Macaca fuscata), Tesi di Laurea, Universita' di Roma La Sapienza*.

Sade, D.S. 1965. Some aspects of parent-offspring and sibiling relations in a group of rhesus monkeys, with a discussion of grooming. *Am. J. Phys. Anthropol.*23: 1-18.

Sade, D.S. 1972. Sociometrics of *Macaca mulatta* I. Linkages and cliques in grooming matrices. *Folia Primatol.*18: 196-223.

Sarkar, P. 2014. Does provisioning initiate more grooming interaction in primates: a study on Assamese macaque. J. Biodiversity and Environmental Sciences (JBES), Vol 4 (3): 211-219.

Schino. G., Scurcchi, S., Maestripieri, D.and Turillazi, P.G. 1988.Allogrooming as a tension-reduction mechanism : A behavioral approach. *Am. J. Phys. Anthropol.*16: 43-50.

Seyfarth, R.M. 1977. A model of social grooming among adult female monkeys. *J. Theor. Biol.* 65: 671-698.

Silk, J.B. 1982. Altruism among female *Macaca radiata* : explanations and analysis of patterns of grooming and coalition formation. *Behaviour* 79: 162-188.

Troisi, A. and Schino, G. 1987. Environmental and social influences on autogrooming behaviour in a captive group of Java monkeys. *Behariour* 100: 292-303.

Troisi, A., Schino, G. and Aureli, F. 1987. Proximity and allogrooming in two species of macaques. *Monitore Zoologico Italiano* 21: 204.

Troisi, A., Schino, G. and Aureli, F. 1989. Allogrooming and inter individual proximity in two species of macaques (*Macaca facicularis* and *M. nemestrina*).*Behaviour* 86: 196-207.

Turillazi, P.G., Marchini, S., Alessandroni, P., Baldo, N., Campanella, C. and Trucchi D. 1982. Social grooming in *Macaca fuscata.* In: *Annali Dell'istituto Superiore Disanita'* 18: 239-266.

How to cite this article:

Prabal Sarkar and Anindita Bhattacharya. (2015). Who grooms more – male or female? Study on provisioned group of Assamese macaque.Int. J. Adv. Res. Biol. Sci. 2(12): 228–233.