

ASSESSMENT OF SOCIAL STRESSORS AMONG WILD FEMALE BARBARY MACAQUES (*MACACA SYLVANUS*) THROUGH THE MEASUREMENT OF SELF-SCRATCHING AND FAECAL GLUCOCORTICOIDS

S.S.K. Kaburu^{1,2}, S. Semple², B. Majolo³, A. MacLarnon²

¹*School of Anthropology and Conservation, Department of Anthropology, Social Sciences Faculty, University of Kent, Canterbury, Kent CT2 7NR, U.K* Centre for Research in Evolutionary Anthropology, ²*Centre for Research in Evolutionary Anthropology, Roehampton University, Holybourne Avenue, London SW15 4JD, UK,* ³*School of Psychology, University of Lincoln, Brayford Pool, Lincoln, LN6 7TS, UK.*

Presenter's Email: sskk2@kent.ac.uk

One of the main costs of sociality is increased competition over resources, which often escalates to aggressive behaviour. Therefore, competition has been viewed as one of the main social stressors that animals experience. To date, researchers have employed both behavioural and physiological measures to assess non-invasively animals' stress levels. The behavioural methods are generally based on the measurement of self-directed behaviours, which have long been associated with anxiety, a subset of stress. At the physiological level, researchers have used faecal or urinary glucocorticoids to measure animals' hormonal response to stressful events. Our research aimed to investigate the effects of competition on emotional state among wild female Barbary macaques (*Macaca sylvanus*) living in the Middle Atlas Mountains of Morocco. We used self-scratching (SS) and faecal glucocorticoids (FGCs) to assess female anxiety and stress, respectively, in relation to dominance rank, rates of aggression and approaches and retreats to/from each other. We found that subordinates displayed significantly higher mean rates of SS than dominants, whereas no significant relationship between mean FGCs and rank was found. Furthermore, rates of aggression received and given were positively and negatively, respectively, correlated with SS, but not significantly with FGCs. Lastly, mixed model analyses indicated that on days when females avoided each other while feeding, and/or received aggression from males, they exhibited higher rates of SS, whereas FGCs did not seem to be affected. Overall, our data suggest that lower-ranking female Barbary macaques experience an anxious internal state, which does not appear to result in increased FGCs.

Keywords: Barbary macaque, competition, anxiety, stress