

Group Dynamics of Young Asian Elephant Bulls (*Elephas maximus* Linnaeus, 1758) in Heidelberg Zoo – Integration of a Newcomer in an Established Herd

Gruppendynamik bei jungen Asiatischen Elefantenbullen (*Elephas maximus* Linnaeus, 1758) im Zoo Heidelberg – Integration eines Neulings in eine bestehende Herde

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Abstract

The social organisation of elephants is based on female philopatry and male natal dispersal. The separation of males from their family group is a behavioural strategy of inbreeding avoidance. In the course of this gradual process young bulls increasingly have contact to males belonging to other herds, mainly same-aged, in form of sparring (Kurt & Garaï, 2006; Evans & Harris, 2008; Chiyo, Archie, Hollister-Smith, Lee, Poole, Moss, & Alberts, 2011) with spending more and more time away from their own family (Kurt, 2001; Kurt & Garaï, 2006; Poole & Moss, 2008). After leaving the natal herd they join other males and form loose all-male groups (McKay, 1973; Kurt, 2001; Poole & Moss, 2008). This natural process during the development of male elephants, however, raises a problem for the elephant keeping in zoological gardens because of the increasing intolerance by the herd in combination with the lack of adequate keeping facilities for bulls. As the keeping of young bulls without or limited contact to conspecifics is an unnatural way of handling them, as described above, efforts are made for establishing an appropriate husbandry. Zoo Heidelberg is the first German facility, which keeps a group of young elephant bulls. Moreover it is the first zoo which undertakes the experiment to integrate another young bull in an established group.

The aim of this study was to assess the group dynamics, particularly the individual personalities and social bonds, in a group of young bulls in captivity during the integration of a new bull.

By means of the focal animal sampling (Altman, 1974) the social behaviour of the four young bulls during the first four months of integration of the new bull was continuously recorded. It was quantified by the frequencies of defined social events and the individual duration of social isolation

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and association with another elephant. The durations and the frequencies were standardised as the percentage of the individual observation period and the number of occurrences per hour, respectively, in order to allow the comparison of the individuals.

The four young bulls showed distinct personalities, which affected the strength and kind of social bonds between them. In general the members of the initial group interacted more frequently among themselves than they did with the new one. Particularly the initial three elephants exhibited physical contact and friendly behaviours to a greater extent than the new bull did. But the frequency and the motivation of the associations depended on the social partner both in the case of the initial group members and the new one. Furthermore the behaviour of the new elephant indicated social isolation and an elevated stress level. Beside a high frequency of social interactions, the existence of a dominance hierarchy and the progressive integration of the new bull suggest a stable social structure and therefore support the concept of keeping young bulls in same-sex groups.

Keywords: *Elephas maximus*; Elephant young bulls; Integration; Dominance hierarchy; Zoo Heidelberg

Introduction

As a part of his ontogenesis a male elephant is faced with the change of his social environment. He spends his childhood within the family group consisting of mothers and their offspring, aunts and other female relatives. Besides practical things like food preparation methods (Kurt, 2001) he learns the social rules which are necessary in order to fulfill his role within the society. Before reaching puberty (Kurt, 2001) the social environment of the young male begins to change gradually. He becomes more and more independent of his mother and allomothers thereby leaving the highly structured natal herd and passing over into the fluid system of the bull society whose dynamics differ fundamentally from those of the family group. The organization of the bull society is based on a dominance hierarchy determined by body size and sexual activity. As the relative strength and the reproductive status of its members vary continuously, the structure of the bull society is very dynamic. Although bulls are often seen in small groups and may form long-lasting bonds with certain other males, these are rather loose aggregations compared to the family group (Poole & Moss, 2008). It is highly probable that these observations made in the case of African elephants can be applied to Asian elephants as McKay (1973) also observed mainly solitary males and rarely associations of several bulls in Gal Oya National Park in Sri Lanka. A newly independent male has to learn a fresh set of behaviors (Poole & Moss, 2008) in order to get along with his novel social environment. This second phase of socialization, after the first one within his family, takes place during adolescence when the young bull spends more and more time sparring and playing with other youngsters from outside his family group (Poole & Moss, 2008) thereby assessing his own and the strength of his partners and establishing his position in the dominance hierarchy. On the one hand in this way the rank order is determined. On the other hand close relationships between familiar sparring partners reduce the risk of escalation to a real fight during play fights as adolescents (Chiyo et al., 2011) and might prevent severe conflicts as adults as well. A dominance hierarchy determined at an early age leads to a high level

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