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# Social structure of a semi-free ranging group of mandrills (*Mandrillus sphinx*): which role for central individuals?

The difficulty involved in following mandrills in the wild means that very little is known about social structure in this species. Most studies initially considered mandrill groups to be an aggregation of one-male-multifemale units, with males occupying central positions in a structure similar to those observed in the majority of baboon species. However, a recent study hypothesized that mandrills form stable groups with only two or three permanent males, and that females occupy more central positions than males within these groups. In order to better understand how a mandrill group is structured, we used social network analysis methods to investigate the identity and the role of central individuals in a semi-free ranging group of 19 individuals. We recorded all the dyads of individuals within 0 and 3 meters of each other as a measure of association. The betweenness and the eigenvector centrality for each individual were then calculated and correlated to kinship, age and dominance. Finally, we performed a resilience analysis by simulating the removal of individuals displaying the highest betweenness values. Our results showed that the cumulative distribution of individual betweenness followed a power function, which is characteristic of scale-free networks. This property showed that some group members, mostly females, occupied a high central position. Moreover, we found that these central females were also high-ranking individuals. Finally, the resilience analysis showed that the removal of central individuals splits the network into small subgroups, increases the average number of isolated subgroups, and decreases the network diameter. Critically, this study confirms that females appear to occupy more central positions than males in mandrill groups. As a consequence, these females seem to be crucial for group cohesion and probably play a pivotal role in this species.

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