Partition of social and sexual partner relationships in a polygynous gibbon

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Abstract

Resources critical for successful breeding are typically partition in nature. To increase reproductive fitness, females may associate with males who provide access to high quality resources while mating other males with good or compatible genes. Gibbons have traditionally been described as living in small monogamous groups and the sole resident adult male is assumed to sire all of the group's offspring. Based on 16 years of field observations and microsatellite analyses, we describe the social system and reproductive strategies of a population of Nomascus concolor in the Wuliang Mountains, China. From 2003 to 2018, each of our three study groups consisted one resident male and two breeding females across 98.4% of observation months. Resident males spent 2.3 - 5.6% time (N = 7 pairs) within 1 m of both females in their group, comparable to monogamous gibbon groups. Weakened bond strength predicted male/female replacement in two groups. However, microsatellite analyses revealed that the rate of extra-group paternity (EGP) was 40.0% (N = 15), considerably greater than reported for monogamous gibbon species (0 - 10%). Females engaged in EGP to increase offspring heterozygosity. Resident males seem unable to monopolize the mating activities of females, floater males had reproductive success (N = 2). Our findings indicate that in crested gibbons the social system is distinct from the breeding system. Our study also highlights again that long-term continuous field work and non-invasive genetic analysis are essential for understanding breeding systems of long-lived mammals.

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