

rates were related to male size. Courtship was initiated earlier and courtship cycle was shortened when food was supplemented. Our results support that short-term food availability influences courtship intensity and timing in *U. lactea*.

A108 Breeding Ecology of Black-billed Magpies in Korea (*Pica pica sericea*)

Sang-im Lee, Youna Hwang, Jaeyoung Jeong, Eunyoung Lee, Hyunju Jang and Jae Chun Choe

School of Biological Sciences, Seoul National University, Seoul 151-742, Korea

Breeding success of magpie population on the campus of Seoul National University was assessed from 1998 to 2001. Breeding successes were 2.8, 3.2, 2.5 and 2.8 fledglings/successful nest in those four years. Although the differences among the years were not statistically significant, breeding successes seem to be mostly influenced by climate condition during winter and early spring. It was suggested that winter precipitation affects egg production and temperature during incubation directly influences hatching success. We measured the quality of the chicks using 'Body Condition Index (mass/tarsus length)' in addition to the number of chicks. BCI values were not related to sex or clutch size but to fledging date; better-conditioned chicks fledged earlier. Clutch size and hatching success were measured in 2000 and 2001. The mean hatching success did not differ between the two years, although the mean clutch size was smaller in 2001. In both years, hatching success was not related to clutch size. It seems that magpie breeding success is largely dependent on hatching success rather than fledging success.

A109 Structure and Context of Chatter Call in Korean Black-billed Magpies (*Pica pica sericea*)

Eun Young Lee, Hyun Ju Jang, Sang-im Lee, and Jae Chun Choe

School of Biological Sciences, Seoul National University, Seoul 151-742, Korea

Chatter call is a species-specific signal used in inter- or intra-specific interaction. Korean black-billed magpies were observed to emit this type of call under a variety of circumstances such as territory defence, alarming or mobbing to predator. We studied the acoustical features and behavioral contexts of magpie chatter call. In this study we present (i) acoustic description of chatter call, (ii) trends of call transition and (iii) function of different cadences in communication. Our analysis on the spectro-temporal structure showed that magpies use varied versions of chatter call under different contexts. As antagonistic situation became more serious, number of calls within a bout and call frequency increased but call duration and inter-call interval decreased. In addition, magpies seem to match call cadences when responding to neighbor's chatter call. Our results suggest that black-billed magpies vary chatter call structure to exchange contextual information with the conspecific. In order to reveal precise relationship between structural variation and contextual information, a series of playback experiments will be conducted.

A110 Cooperation of Prey Capturing in the Young of the Subsocial Spider *Amaurobius ferox*

Kil Won Kim, Tae Won Kim and Jae Chun Choe

Laboratory of Behavioral Ecology, School of Biological Sciences, Seoul National University, Seoul 151-742

Cooperative hunting is one of the most widely distributed form of cooperation in animals and may be an important

evolutionary cause of sociality. Matrophagous young of the subsocial spider *Amaurobius ferox* (Araneae, Amaurobiidae) exhibit the collective predation during their post-maternal social period. We examined functional mechanism implicated in the collective prey capturing of the young. Efficiency of the predation increased with the number of individuals in a group while one individual was not able to achieve the task by itself. This cooperation was not indirectly intervened by the production of silk but directly by individual predatory acts. In the course of the social period the body mass of the young that cooperatively captured the big preys caught up with that of the young individually captured only the small preys of the same weight. This result suggests that the young of this subsocial animal profit from living together even after mother's death by their cooperative hunting.

A111 Observation of Collective Hunting in a Subsocial Spide

Kil Won Kim, Youna Hwang and Jae Chun Choe

Laboratory of Behavioral Ecology, School of Biological Sciences, Seoul National University, Seoul 151-742

Young of the subsocial spider *Amaurobius ferox* (Araneae, Amaurobiidae), after cannibalizing their mother, remain together through several instars and feed communally. We video-analyzed the collective prey capturing behavior of the spiderlings. The predation sequences showed great similarities between clutches (latency-orientation-moving-touching-seizing-feeding) and constant patterns in the attacks and holding the prey, which suggest a behavioral organization among the individuals participating in the capture. This collective behavior might involve cooperative mechanism which is one of the most important criterion in the permanent-social spider where siblings successively prolong their stay in the natal nest, hunt for prey collectively and often feed together on prey items.

A112 Geographical Variation of mtDNA ND 6 gene of *Littorina brevicula* (Littorinidae, Gastropods) in Korea

Sook-Jung Kim¹, Jae-Hwa Suh² and Jun-Im Song¹

¹Department of Biological Science, College of Natural Science, Ewha Womans University, Seoul 120-750, Korea ; ²Environmental Risk Assessment Team of LMO, National Institute of Environmental Research, Incheon, Korea

The geographical variation on 11 populations (107 individuals) of the planktonic-developing periwinkle *Littorina brevicula* was analysed in terms of three regions and polluted environments by mtDNA ND6 gene. The sequence (500 bp) and 22 haplotypes were determined by the autosequencer (ABI 310). One main haplotype (*LbndA*) with frequencies from 0.44 to 1.0 was predominated in all populations. Genetic analysis of *L. brevicula* (60 ind.) from the polluted and unpolluted sites yielded 14 distinct haplotypes. Moreover, *LbndA* was most common and shared by 78% of them. In *LbndA* frequency, polluted site (0.872) was significantly higher than unpolluted sites (0.694, $p < 0.005$). And also, 70% of other 13 haplotypes was detected at populations of unpolluted sites ($p < 0.001$).

A113 Phylogeny of SINE-R Retroposons in Asian Apes

Ji-Won Lee¹, Joo-Mi Yi, Seung-Heui Jeon, Kyung-Mi Shin, Myung-Sook Kim, Jin Choi, A-Ram Jung, Kyung-Won Hong, Jae-Won Huh, Won-Ho Lee and Heui-Soo Kim

Division of Biological Sciences, College of Natural Sciences, Pusan National University.

The SINE-R retroposon family was derived from the long terminal repeats (LTRs) of human endogenous retrovirus K (HERV-K) that had been active during the hominoid evolution. The retroposons and HERV-K