

B548 Changes in Ion Concentrations of Soil Solution According to Different Sampling Time and Cutting Intensity in *Pinus rigida* Plantations¹

Kwang-In Oh¹, Hi-Doo Cho¹, Ki-Wan An¹ and Choonsig Kim^{2*}
Dept. of Forestry, Chonnam National Univ.¹ and Forestry Research Institute²

Some ion concentrations (NO_3^- , Ca^{2+} , Mg^{2+} , NH_4^+) of soil solution in mature *Pinus rigida* plantations in Goksung, Chonnam Province, were measured at two soil depths (10cm and 30cm) following various levels of cutting intensity treatment (uncut, 6m×50m, 10m×50m, 20m×50m strip clearcutting) three times (July 6, July 30, and August 4) between June 20 and August 4 1998. The ion concentrations of the soil solution were significantly different among sampling times, while the concentrations were not differed among cutting levels or sampling depths. The ion concentration in the soil solution decreased in the order of $\text{NO}_3^- > \text{Ca}^{2+} > \text{Mg}^{2+} > \text{NH}_4^+$. These ion concentrations except for NH_4^+ ion were negatively correlated with the volume of collected soil solutions ($r = -0.31 \sim -0.41$). The results suggest that the change in nutrient concentrations at the soil solution at the *P. rigida* plantations was related to the temporal input patterns of precipitation rather than the cutting intensity.

B549 Energetic Analysis of the Foraging Behavior in Eastern Curlew (*Numenius madascariensis* : Ciconiiformes, Aves) and the Energy Content of the Crab Prey, *Macrophthalmus japonicus* (Decapoda, Crustacea) in Intertidal Habitat

Yi, Jeong-Yeon*, Pyong Oh Won and Jeong-Chil Yoo
Department of Biology, Kyunghee University

Characteristics of foraging behavior in Eastern Curlew (*Numenius madagascariensis* : Aves) were studied in Kanghwa Island and Mankyung Estuary. Their main foraging behaviors were single and multiple probing for the burrow-dwelling crabs, mainly *Macrophthalmus japonicus*. Their foraging intensity was greatest two-hours before and three-hours after the local low tide in Mankyung Estuary. But the intensity was highest at one-hour before the local low tide in Kanghwa Island. It is considered that the difference of the peak foraging time between two sites is related with the surface activity of the crabs. From the allometric relationships between body size and energy content in *Macrophthalmus japonicus*, the estimated energy intake rates per day in Eastern Curlew were 99.43 to 1031.63 kJ during their stopover period in Kanghwa Island. And the preferred size of prey crabs were 15 to 20mm, which was the most profitable size categories in the trade-off between the capturing effort and the subsequent energy intake. Eastern Curlew could maximize their energetic intake rate, not by the overall frequency of capturing rate per unit time, but by selecting the most profitable size of prey.