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Song mode responses of Bush warbler (*Cettia diphone*) to playback

Park, Shi-Ryong* and Park, Dae-Sik

한국교원대학교 생물교육과

Bush warbler song consists of the introductory whistle portion and complex ending syllable portion and is divided into two song modes, the alpha and beta modes. The alpha mode is a song which has fewer two notes in the whistle portion, while a song which has more two notes in the whistle portion is a beta mode. In order to clarify the use of song mode for territorial defence, playback experiments with only repeated alpha mode, only repeated beta mode, and naturally-produced stimulus songs were executed. During playback, thirtenn subject males significantly sang fewer songs than post-playback, and also significantly sang higher the proportion of beta mode during and after playback than that in natural situation. The proportion of matched singing was highest to only beta mode playback and lowest to only alpha mode playback. The proportion of beta song mode to responded total song was constantly decreased. These results present that beta song mode of bush warbler is used for intra-sexual competition and has the function of the threat and repulsion to male listener.

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Courtship Behavior and Sexual Dimorphism of the salamander, *Hynobius leechii*

Park, Shi-Ryong*, Park, Dae-Sik, and Yang Suh Yung¹

한국교원대학교 생물교육과, 인하대학교 생물과¹

The courtship behavior and the sexual dimorphism of the salamander *Hynobius leechii* were studied. The parameters, snout vent length, body length (from snout to tail tip), and proportion of snout vent length to body size were larger in the female than the male. Five physical parameters in males were significantly correlated with one another, body length, snout vent length, head width, tail vent length, and tail depth, while all, except tail depth, were significantly correlated in females.

Sexual behavior of *Hynobius leechii* involved external fertilization and consisted of three stages, identifying the female, attracting the female, and insemination. The identification stage consisted of a positive advance by the male toward the female and displays of snout contact. The male attracted the female with chin rubbing, tail undulation, smelling, and digging displays. The insemination process consisted of four phases, amplex, separating egg sacs from the female's cloacal, fertilizing eggs, and post fertilization.