

Variability of *Ciconia boyciana*'s footprints on the homogenous sediment.

*Ikuko Tanaka^{1,2}, Yasuo Ezaki^{3,4}, Minoru Funakoshi⁴, Kazuhito Yamasaki¹, Masayuki Hyodo^{5,1}

1.Department of Earth and Planetary Sciences, Kobe University, 2.The Japan Society for the Promotion of Science, Research Fellow, 3.Graduate School of Regional Resource Management, University of Hyogo, 4.Hyogo Park of the Oriental White Stork, Hyogo, 5.Research Center for Inland Seas, Kobe University

An ichnological experiment using *Ciconia boyciana* was carried out to reveal morphological variability of tracks left on a potter sediment by 2 individual birds. We obtained a total of 56 tracks, for each of which the area, length, width, depth, and volume were measured. The average value of the track area was almost equal to its median value. *Ciconia boyciana* generally left morphologically uniform tracks, suggesting that it controls digit-substrate interaction to keep body balance. A unique anatomical feature is that *Ciconia boyciana* does not leave metatarsal impression, unlike other wading birds. This feature will be useful to identify *Ciconia boyciana* from other trackmakers being similar in body weights and habitats. Track width has a wide range of variability up to 40 %, which can be caused by the linkage of muscles between leg and foot being characteristic to birds. The co-efficient analysis of track geometry reveals that the width and depth of a track have a trade-off relationship to keep a same volume. Application of the theoretical morphology analysis to the track data reveals that the outer digits take a lot of the body weight in *Ciconia boyciana* while walking.

Keywords: foot morphology, *Ciconia boyciana*, classification, track fossils, limb anatomy