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Title	SEX DETERMINATION OF GOAT AND FOX SKELETON BY MEANS OF DISCRIMINANT FUNCTION ANALYSIS
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Citation	Japanese Journal of Veterinary Research, 34(2), 162-162
Issue Date	1986-04-30
Doc URL	https://hdl.handle.net/2115/3009
Type	departmental bulletin paper
File Information	KJ00002374416.pdf



SEX DETERMINATION OF GOAT AND FOX SKELETON BY MEANS OF
DISCRIMINANT FUNCTION ANALYSIS

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The purpose of this study was to evaluate the discriminant function analysis method for sex determination of goat and fox skeletons as an application of the multivariate analysis method in comparative anatomy.

Eighteen bones each from 56 goats (*Capra hircus*) and 48 crania of silver foxes (*Vulpes vulpes*) were used in this study. The sex of the goat bones could not be determined by examination of non-metric macroscopical traits or measurement of single points besides the horns. Applying the discriminant functions, however, without horns it was possible to identify the sex almost completely. Especially, clearer sexual dimorphisms were found in the cervical vertebrae, Atlas and Axis, than in the pelvis. These findings suggest a close relation between these characters and the behavior and ecology of the animals.

Next this method was employed to observe the crania of yearling silver foxes, of which sexual differences were difficult to identify in non-metric traits, and for about 85% of the specimens, the sexes were identified by this method.

Furthermore, by making a comparison of the coefficients of each term in the formulae, the order of quantities concerning sex determination could be examined with the functions consisting of standardized measurements. In the fox craniums, it was noted that the longitudinal length of the upper cranium had the strongest relation with the sex of the foxes.

The results of this study suggest that discriminant function analysis is more useful for the sex determination of goat and fox skeletons than other routine procedures such as examining the macroscopic non-metric traits or comparing single measurements of bones.