

## **Biometrics measurements in Red foxes (*Vulpes vulpes*) in the Picentini area. Discussion and conclusions.**

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Techniques for assigning individual to age-classes and/or distinguish between sexes are necessary to understand population dynamics and behavioral interactions of Red foxes (*Vulpes vulpes*). Many studies have focused on separating juveniles from adults; age of captured live pups can be estimated from morphological changes, hind foot (HF) length, zygomatic (Z) width and body weight<sup>1</sup>. Methods that avoid capturing the animals would be particularly useful, but none is available. In this paper biometric differences between young adults and adults subjects and between sexes are investigated.

Lower canine length (LCL), lower canine width (LCW), condilo-basal (CB) and scapular length resulted smaller than female adults, whereas male young adults had withers height, occipito-coccygeal (OC), ear length, and upper canine width (UCW) smaller than male adults. Almost all the parameters included in this study confirmed sexual dimorphism and some of the differences already present in young adults gained significance (from  $P < 0.05$  to  $P < 0.01$ ) in the adult foxes. In particular bodyweight, OC length, withers height, ear length, upper canine length and LCL, scapular and mandibular length, and inter-carnassial (IC) and Z width were significantly greater in male than in female adult foxes ( $P < 0.01$ ). Nasal-occipitalis (NO) length, total length, UCW and LCW, and upper dentition (UD) were significantly greater in male than in female adult foxes, as well ( $P < 0.05$ ).

The low number of subjects included in each category, strictly due to hunting season, did not allow estimating an accurate range for the biometrics measurements performed and probably biased recordings, producing some contradictory results. Fox size varies geographically, thus mean adults measurements should be determined for each area in which they have to be applied<sup>1</sup>. HF method has been demonstrated to be an accurate method for assessing age of pups<sup>1</sup>; our data suggest that it might be as efficient in young adults, at least in female subjects. On the other hand, our results confirm the sexual dimorphism in the canine region to be higher than in the carnassial region (data not shown in our results)<sup>2</sup>.

Key words: Red fox, *Vulpes vulpes*, biometrics measurements, young adults, adults, sexual dimorphism

References: <sup>1</sup>Sargeant et al. 1981 J. Wildl. Manage. 45(3): 760-765 <sup>2</sup>Szuma 2000 Ann. Zool. Fennici 37: 113-127.