BIOMETRIC DATA AND GROWTH RATES OF A WILD BOAR POPULATION LIVING IN THE ITALIAN ALPS

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Abstract: From 328 wild boars *(Sus scrofa)* killed during the 1986-1992 hunting seasons (end of September - early December) the following body variables were measured: full body weight (kg), total length (cm), shoulder height (cm), length of metatarsus (cm) and length of the mandible (mm). Animals were aged from tooth eruption and wear and six age classes were established. The regression curve of the variables for each sex was calculated; the regression fits a multiplicative model $y = ax^b$. The males show higher r and r^2 values than females for every variable. This indicates that males show smaller variability due to sexual selection for bigger and stronger animals.

Keywords: Wild boar, *Sus scrofa,* Suidae, Weight, Biometry, Measurements, Europe.

1. Introduction

The Italian Wild boar population was considered as composed by two subspecies: *Sus scrofa scrofa* and *S. s. majori.* Recently Groves (1981), Apollonio *et al.* (1988) and Randi *et al.* (1989), by means of morphologic and electrophoretic analysis, have concluded that the Italian Wild boar population should be considered as belonging to the European subspecies *S. s. scrofa* and stated that the morphologic differences found may be caused by environmental factors affecting the growth of the individuals living in harsh habitat (mediterranean or mountainous). Besides a dimensional cline running NE-SW has been identified with bigger animals found in North-East Europe and smaller in Spain and Italy.

The Piedmontese population is geographically and environmentally located between the peninsular Italian and French populations and thus they should present intermediate morphological characteristics.

The aim of this paper was to study the morphology and the growth rate of the wild boars living in the Piedmontese Alps.

2. Material and methods

On 300 animals killed during the hunting seasons 1986-1992 and aged by tooth eruption and tooth wear (Iff, 1978), the following measures were recorded:
- Weight (undressed or field dressed);
- Total length (from the snout to the base of the tail);
- Tail length (from the base to the tip);
- Shoulder height;
- Metatarsus length.

Besides 89 mandibles were collected and 13 measures taken according to Von der Driech (1976) (Tab. 1). Some measurements were meant to be done only on adult individuals and some minor changes were made to allow their utilization on young animals.

Six age classes were identified: Class 1: ≤ 6 months; Class 2: 7-12 months; Class 3: 13-18 months; Class 4: 19-24 months; Class 5: 25-30 months and Class 6: ≥ 31 months.

In order to describe the growth pattern in the two sexes regression analysis was performed for all measurements using the age class as independent variable.

A Correlation analysis was performed to analyse the relative growth of the measurement.

The differences between males and females within each age class have been tested with the Mann-Whitney U-test in order to assess the development of the sexual dimorphism. This non-parametric test was chosen because the data were not normally distributed.

3. Results and discussion

The regression analysis performed between all measurements resulted in high "r" values indicating that the body growth is uniform. From the regression analysis it appeared that the best fitting model was the multiplicative one ($y = ax^b$). Regression analysis resulted highly significant but the weight (undressed weight in males

**Table 1 - Measures taken on mandibles. Numbers are those used by Von der Driech (1976). Measures marked with #
are those that have been modified in order to be taken also on young animals.**

 1 - Length from the angle Gonion caudale - Infradentale
 2 - Aboral border of condyle process - Infradentale
 3 - Gonion caudale - aboral border of the most aboral alveolus #
 5 - Gonion caudale - aboral border of the alveolus of P_2
9a - Length of the Premolar row measured along the alveoli on the buccal side
11 - Oral border of the alveolus of P_2 - aboral border of the alveolus of I_3
12 - Mental prominence - Infradentale
13 - Gonion ventrale - highest point of the condyle process
14 - Gonion ventrale - deepest point of the mandibular notch
16a - Height of the mandible behind fast erupted molar, from the most aboral point of the alveolus #
16b - Height of the mandible in front of M_1
16c - Height of the mandible in front of P_2
21 - Greatest diameter of the canine alveolus

and field dressed weight in females) showed the best "r" and "r²". Among the mandible measurements the regression analysis resulted in "r" and "r²" statistics closer to the maximum value (unity) than the body ones (except weight). The measurements taken on the mandible are more reliable in assessing the age than the body measurements. This may be due also to the better working condition because the body measurements were taken "on the field" while mandible measurements were taken later in the laboratory. Again females showed lesser variation within each age class than males.

All most reliable measurements (*i.e.* those measurement that showed higher "r" and "r²" values) indicate that the differences between males and females within each age class are statistically highly significant from age class 4 onward (*i.e.* after at least 19 months).
The growth is fast in the first 18 months (age classes 1-3) for both sexes, later the growth of the females slows down and the difference from males emerges (Fig. 1a,b,c).
The reduction of the growth rate occurs when most of the females become pregnant and give birth to their first litter (Kratochvil *et al.*,
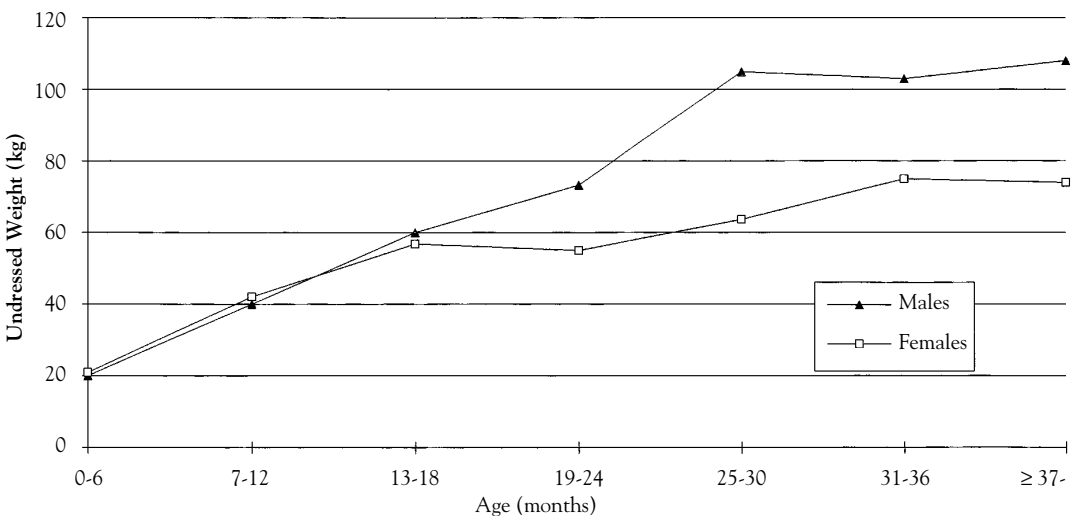

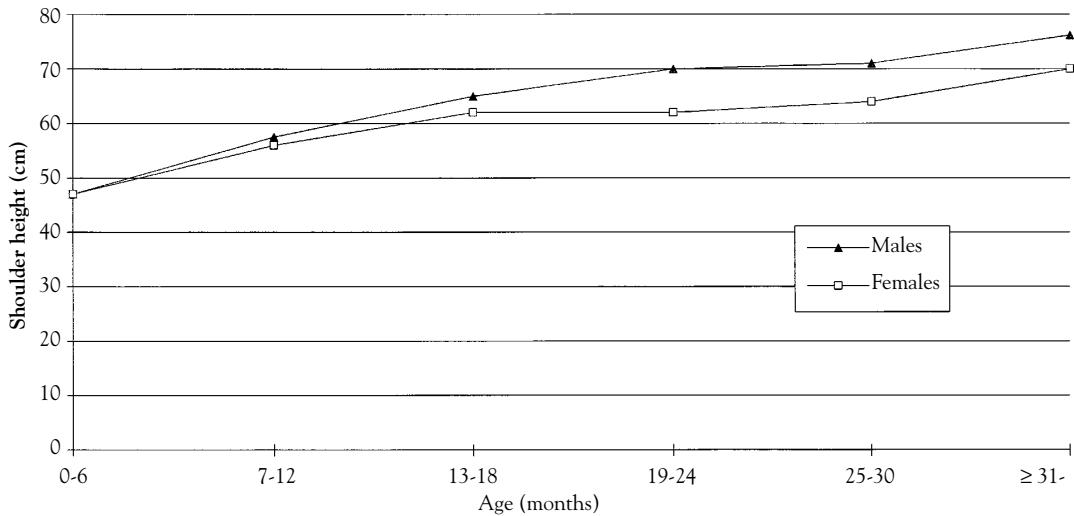Figure 1a - Dynamics of undressed weight in males and females.

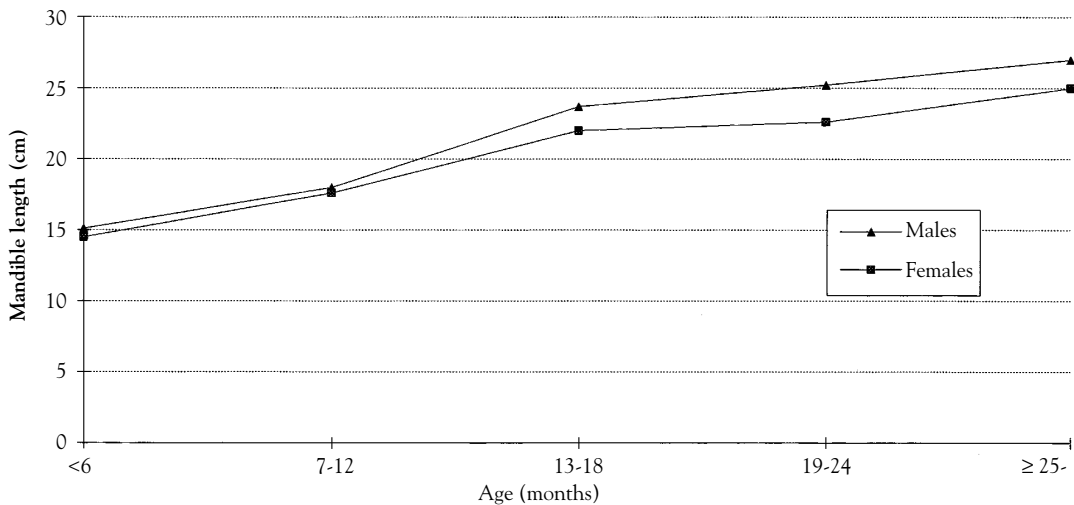Figure 1b - Dynamics of shoulder height in males and females.

Figure 1c - Dynamics of mandible length in males and females.

1986; Pedone *et al.*, 1991): the effort of the pregnancy may be the main cause of the observed phenomenon.

The growth of the males continues at least up to age class 4 and this result is consistent with the observation of Genov (1992). In this sample, anyway, only one male resulted older than 3 years and for this reason the male's growth rate do not reach the predictable "plateau".

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