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DISEASE IN WILDLIFE OR EXOTIC SPECIES

Caries, Periodontal Disease, Supernumerary Teeth and Other Dental Disorders in Swedish Wild Boar (*Sus scrofa*)

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Summary

Between January and December 2013, the dental and periodontal health of 99 Swedish wild boars (*Sus scrofa*) was investigated. Sampling occurred in conjunction with routine hunting at six large estates in the southern and middle parts of Sweden. All six of the estates use supplemental feeding. The weight of the animals, their sex and their dates of death were noted. Age was estimated using tooth eruption and tooth replacement patterns. The oral cavity was inspected and abnormalities were recorded on a dental chart modified for wild boars. The findings included supernumerary teeth, absence of teeth, mild class II malocclusion, severe tooth wear, periodontitis, calculus, caries, tooth fractures and the presence of enamel defects. Swedish wild boars suffer from different dental lesions and the impact of supplemental feeding on dental and periodontal health is still to be investigated.

Keywords: dental disease; Sweden; wild boar

Introduction

During the last three decades, populations of wild boar (*Sus scrofa*) have increased remarkably in Europe (Boitani *et al.*, 1995; Fruzinski, 1995; Ježek *et al.*, 2011). In Sweden, since the reappearance of this species in the 1970s (following escape from enclosures), the population has increased to more than 150,000 individuals (Swedish Environmental Protection Agency, 2010). The reasons for this rapid increase are thought to be the adaptive and reproductive ability of the wild boar (Servanty *et al.*, 2007), in combination with extensive supplemental feeding and low population control (via hunting). Basic knowledge about the Swedish wild boar and its management is limited and the few studies published mainly describe wild boar movement patterns, behaviour and habitat selection (Welander, 2000; Lemel *et al.*, 2003; Truvé and Lemel, 2003; Thurfjell *et al.*, 2009; Jansson *et al.*, 2011).

Although controversial, supplemental feeding occurs in all areas in Sweden with wild boars and the types of food that are given range from different grains, to sugar beets to by-products from the food industry. Many opinions concerning supplemental feeding and its effects have been raised. For example, supplemental feeding with bakery products has been thought to cause dental caries in wild boars. However, the overall knowledge about oral and dental health in wild boars is limited. The normal dentition of wild boars (family Suidae) includes incisor (I), canine (C), premolar (P) and molar (M) teeth and the total permanent dentition is: 2× (I3/3 C1/1 P4/4 M3/3) = 44 and the deciduous dentition is: 2× (i3/3 c1/1 p3/3) = 28, where lower-case letters indicate deciduous dentition (Matschke, 1967). The few studies that have been published are from continental Europe (including the Balkan Peninsula) and mainly consist

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of case reports describing different lesions on male wild boar tusks (Konjević *et al*., 2004; Kierdorf *et al*., 2004a,b). Two studies have reported enamel hypoplasia (Kierdorf *et al*., 2000, 2004a) and in one of these studies a high level of fluoride was determined to be the cause of the lesions (Kierdorf *et al*., 2000). To our knowledge, no profound and comprehensive studies on oral health that include the entire oral cavity and dentition in a population of free-ranging wild boars have been presented. The aim of this study was to evaluate the dental and periodontal health in free-ranging Swedish wild boar.

Materials and Methods

This study was conducted between January and December 2013 as part of a larger study on female wild boar reproduction. In Sweden, wild boars are legally hunted throughout the year and sampling occurred in conjunction with routine hunting at six large estates in the southern and middle parts of Sweden (area range 900–8700 ha, Fig. 1). All six of the estates use supplemental feeding such as silage, whole grains (wheat, corn and oats), potatoes, carrots, sugar beets and pellets in various compositions. None of the estates use any processed human food such as bakery products.

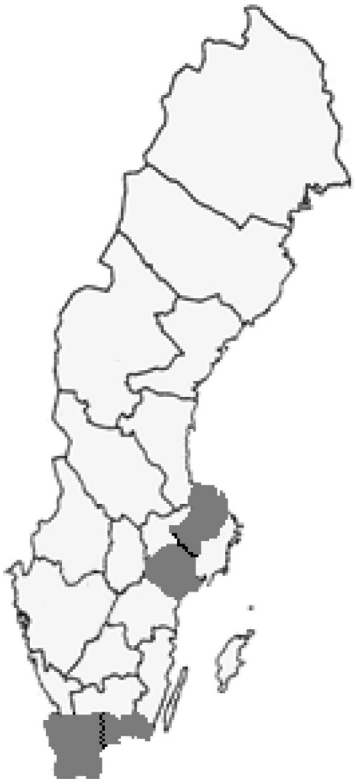

Fig. 1. Map of Sweden showing the counties (grey) where wild boars were sampled.

All carcasses were weighed and the dates of death and sex were noted. Age was estimated using tooth eruption and tooth replacement patterns (up to 26 months) according to Matschke (1967) and the animals were categorized into seven different age classes (Table 1). To enable oral examination, the jaws were opened by a lateral incision through the masseter muscle and manually separated. The oral cavity was inspected and abnormalities were recorded on a dental chart modified for wild boars (Fig. 2).

Dental anomalies, absence of teeth, supernumerary teeth, tooth fractures, caries and malocclusion were documented. Only wild boars in age class 3 (12–15 months) and above were examined for absent teeth. In order to assess oral health, four indices were used: calculus index (CI), tooth wear (TW), mobility (M) and periodontal index (PDI), adapted to field conditions (Table 2). Evaluation of hypodontia was performed only in animals in age class 3 and above, when all deciduous teeth should be replaced.

Tooth lesions such as dental caries, fractures and presence of enamel defects were noted. Caries was defined as a discoloured area of the tooth surface into which a dental explorer could be inserted and which offered a slight resistance when removed (Harvey and Orr, 1990; Sauther *et al*., 2002).

Results

In total, 99 wild boars were included in this study, of which seven were males and 92 were females. The age distribution and the distribution of supernumerary teeth (additional teeth, also referred to as polydonty or hyperdontia), absence of teeth, fractures, caries and enamel lesions according to age class are shown in Table 1.

Supernumerary teeth were found in eight wild boars and among these, three had one extra tooth located between the mandibular P3–P4, another animal had two extra teeth bilaterally between the mandibular P3–P4 and one animal had an extra tooth located between the mandibular P1–P2. In two animals, a persisting i2 in the maxilla was present. One animal had one extra maxillary I2.

Absence of teeth was the most common dental anomaly, occurring in 68.7% of the examined skulls ($n = 46$, Table 3). In total, 145 teeth were missing and the most commonly missing tooth was P1 ($n = 90$), in particular the mandibular P1 ($n = 72$). In one individual, in age class 7, all teeth ($n = 32$) except I1, I2, C1 in both the mandibles and maxillae, were missing.

Mild class II malocclusion (distoclusion; Wiggs and Lobprise, 1997) was present in one animal (age