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Preliminary analysis of the diet of wild boar (*Sus scrofa* L., 1758) in Islamabad, Pakistan

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Abstract: During the present study, 117 wild boars (*Sus scrofa*) were killed to examine their stomach contents in Islamabad, Pakistan. Stomach contents were found to be correlated with feeding sites, plant material, and the nature of food material and items consumed from both cultivated and noncultivated lands. The major component of the wild boar's diet in Islamabad was garbage (58%), followed by dead animals (16%), while the rest of the consumed food comprised cereals, herbs, grasses, weeds, tree bark, etc. Wheat leaves were prominent in samples collected from December 2005 until March 2006, when wheat grains (seed formation stage) became the major part of diet until July; maize was also a part of the diet during the same period. A small quantity of tree bark and *Zizyphus* leaves were also found in the stomachs, and mesquite was heavily consumed in June and July. Several grasses and weeds appeared prominently in the diet during the period between August and November. The presence of garbage among other food items was highest in the stomach throughout the year.

Key words: Wild boar, food items, garbage, Islamabad

Introduction

Wild boar (*Sus scrofa* L., 1758) (Artiodactyla: Suidae) is omnivorous and changes its habits according to the availability of food and habitat. It is found in diverse ecosystems (Gerard et al., 1991; Durio et al., 1995). Pakistan is part of the south Asian ancestral homeland of the Eurasian wild boar (*S. scrofa*). Wild boar is found throughout the lowlands of Pakistan along the Indus River. The population of wild boar is relatively high because it has increased rapidly as a result of a number of factors, such as the presence of ideal habitats, proper escape cover, and availability of nourishing food at trash sites next to

hotels and other food points (Beg, 1990). It has now been declared as a serious economic pest of agricultural crops (Abbas and Hafeez, 2004). During the last decade, the food of wild boars has been studied extensively. The wild boar's diet is based predominantly on plants and, to a lesser extent, animals (Schely and Roper, 2003). Many authors consider wild boars as omnivores, as their basic food is derived from plants. In certain parts of eastern and western Europe, studies of its diet indicated that about 80% to 90% of its total food mass came from plants (Janda, 1958; Haber, 1966; Genov, 1981). Some preliminary studies on the wild boar's food habits in

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Pakistan were carried out in the lower Sindh region by Smiet et al. (1979) and in Faisalabad by Khan (1983). The wild boar is a common pest animal in the irrigated croplands of central Punjab. It is also found in forested tracts, marshy areas, and dry thickets of acacia and mesquite species interspersed with croplands. It is considered to be the second most important vertebrate pest in agriculture in Pakistan due to its extensive damage to a variety of crops (Shafi and Khokhar, 1986; Brooks et al., 1989). One of the essential requirements for its control is to determine the composition of its diet in the irrigated crop areas.

The objectives of this study were to determine the annual food habits of the wild boar and compare seasonal changes in its diet in Islamabad.

Materials and methods

Wild boars were collected from several habitats of Islamabad in 2005 through a control project, "Non-chemical control of wild boar population in the area of Islamabad," by shooting.

A total of 117 wild boars were killed and their stomach contents were analyzed in the laboratory of the Department of Forestry, University of Agriculture, Faisalabad. Approximately 100-150 g of stomach contents were removed and placed in 5% formalin. Attempts were made to remove the contents of both the upper and lower portions of the stomach.

Samples were placed in a petri dish and examined under a dissecting stereomicroscope. The fragments of plant and animal tissues were identified on the basis of plant samples collected from crop fields and garbage. The proportions of individual items were estimated as percentages of the total mass.

Interspersed with these crop areas, uncultivated and urban areas are wastelands with mesquite (*Prosopis juliflora*) and acacia (*Acacia arabica* and *A. modesta*) growth, whereas marshy areas have dense coverings of *Saccharum* and *Typha* species. Forest and watery swamp areas provide abundant habitat for wild boars in Islamabad. In this study, 78% of the wild boars were collected from habitats occurring along roadsides near garbage, 14% were collected close to the trapping sites, and the remaining 8% were collected from the cultivated lands located around Quaid-i-Azam University, Islamabad.

Availability factors for each plant or crop species were ranked by researchers who spent considerable time in the cultivated and noncultivated areas of Islamabad. Crops that remained for 5 months or more (wheat) were rated as abundant, while a crop with a growing season of less than 5 months was rated as frequent. Crops with very limited acreages were rated as infrequent. Preference ratings in diet were calculated for each major sow species by using the formula of Charmrad and Box (1968): Preference rating = % Frequency of Occurrence × % of Mass/Availability Factor.

Results and discussion

Food items identified

Twelve food items were identified in the collected samples from the stomachs of wild boars. Two items were cultivated plants, wheat and maize, and 10 were noncultivated plants, including woody plants, grasses, weeds, and seeds of different plants. The data showed that wild boars rely chiefly on herbaceous plants and garbage for the bulk of their diet (Table). Animal matter made up only a small amount of the total mass of the diet. In stomach samples from wild boars collected around Quaid-i-Azam University, 85% of the diet consisted of both wheat leaves and grains. Details of diet components are given in the Table.

An important fact was revealed by the data: wheat leaves and grain were found in the stomach contents of those wild boars that were collected near the cultivated fields in the vicinity of Quaid-i-Azam University, while leaves and grains of maize were found in the stomachs of the wild boars collected from the maize fields along the NARC experimental field. Mesquite (*Prosopis juliflora*), beri (*Zizyphus nummularia*), and acacia (*Acacia modesta*) seeds were also found in the stomachs of some of the animals killed in the forest areas. There was a high percentage of garbage found in the stomachs of all the wild boars regardless of the location of their habitat. This was due to availability, taste, and nutritional value of food items present in the garbage easily found in the research areas. The animals preferred to feed on the food material found in the garbage, such as pieces of Tetra Pak paper, polyethylene bags, diapers, used tea leaves, rotten fruits, different types of vegetables, and

Table. Percentage and frequency of identified food items consumed by wild boars.

	Food Items	% of Mass	Freq.	AF	PR
1	Wheat (<i>Triticum aestivum</i>)	6	7	1	42
2	Maize (<i>Zea mays</i>)	2	5	1	10
3	Mesquite (<i>Prosopis juliflora</i>)	1	8	2	4
4	Acacia (<i>Acacia modesta</i>)	2	4	3	2.66
5	Beri (<i>Zizyphus nummularia</i>)	5	18	3	30
6	Garbage	58	28	4	406
7	Animal Tissues	16	24	3	12.8
8	Grasses (Leaves)	5	22	4	7.50
9	Weed (Leaves)	2	18	4	9.00
10	Unidentified Plants	0.2	6	–	–
11	Mud and Soil	0.8	4	4	1.8
12	Tree Bark	2	13	3	11.33

Percent of mass = % of sample stomach contents (100 g)

Frequency = Number of occurrences per stomach

AF = Availability factor (Rare = 1, Infrequent = 2, Frequency = 3, Abundant = 4)

PR = Preference rating (Percent of mass × Frequency/AF)

household wastes (Table). Animal tissues were also found in the stomach contents of those wild boars caught near the slaughterhouse or poultry farms. In some cases, leaves of grasses, weeds, and tree bark were also found in the stomach contents. Feeding on vegetable material is a natural habit of the animal and it also improves the digestion process (Beg and Khan, 1982). The grasses increase the fiber contents in food and ultimately help the digestion of other materials (Genov, 1981). Mud was also found in some stomachs, as the wild boar loves wallowing in mud and takes in some quantity of it during the process. In addition to this, the wild boars take up mud along with other foods present on the ground.

Seasonal changes in diet

Pronounced changes in diet were observed as patterns. Wheat became prominent in December and its leaves remained part of the diet until June, whereas wheat grain appeared in June and July. Noncultivated plants like mesquite and acacia were an important part of the diet from November to June. Grasses and weeds, mainly the leaves and occasionally the seed

heads, were important items of the diet. The most important component of the diet of wild boars found in Islamabad was garbage, throughout the year. The main justification is its easy availability. Genov (1981) reported that cultivated plants made up 71% of the total mass of wild boars' diet and occurred in 89% out of 181 stomachs of wild boars observed in Poland. He further added that plants formed 91% of the total diet mass and occurred in 99% of the stomachs. Animal food comprised 9% of the total mass and was found in 47% of the stomachs, but it was not considered of real importance in the diet of the wild boar. According to the present study, cultivated plants in Islamabad made up 25.2%, while animal mass (16%), mud (0.8%), and garbage (58%) were also found in the stomachs of all the wild boars collected from the research area (Table).

These trends are given graphically in the Figure to show the seasonal change in the diet of wild boars in Islamabad. The impact of garbage on the wild boar was significant. Reduction of damage to plantations by wild boars can be achieved if adequate measures of

wild boar control can be developed effectively. At present, it appears that lethal control through shooting, snaring, and poisoning is the most promising solution. The wild boar belonging to the Islamabad agroecosystem is primarily an herbaceous consumer. It is also frequently found in mesquite or

acacia thickets, forested areas, low-lying marshy habitats, and close to garbage sites. This mixture of habitat types allows the wild boar to consume several crops in season. Their diet in Islamabad could be characterized as moderate in protein and high in fiber and energy throughout the year.

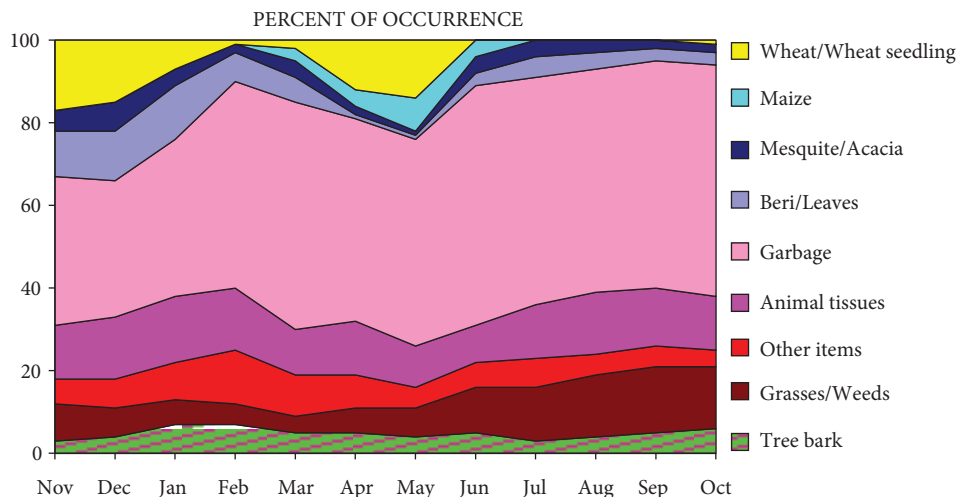


Figure. Monthly changes in dietary items of wild boars based on frequency of occurrence.

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