

A Brief Study on Diet Components of Red Fox (*Vulpes vulpes* Linnaeus, 1758) From Central Anatolia (Mammalia: Carnivora)

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Abstract: The aim of this research was to determine the diet preference of red fox (*Vulpes vulpes*), distributed adjacent to the urban settlement. The spring, summer and autumn diet composition of red fox was examined on analysis of faeces (n=37) in districts of Kırıkkale, Central Anatolia in 2002. The diet is mainly composed of Guenther's vole (*Microtus guentheri*) and grape (*Vitis* sp.) depended on its habitat and prey availability. Tristam's jird (*Meriones tristrami*), bird feathers, cockchafer (*Melolontha* sp.), apricot (*Prunus* sp.) and blackberry (*Rubus* sp.) were also determined in low quantity in the faeces.

Keywords: Diet preference, faeces, *Vulpes vulpes*, Central Anatolia, Turkey

Orta Anadolu'daki kızıl tilki (*Vulpes vulpes* Linnaeus, 1758)'nin besin tercihi üzerine kısa bir çalışma (Mammalia: Carnivora)

Özet: Bu çalışmanın amacı yerleşim alanlarına yakın yaşayan kızıl tilkinin (*Vulpes vulpes*) besin tercihini belirlemektir. Orta Anadolu'daki Kırıkkale ilinin ilçelerinde 2002 yılında, kızıl tilkinin ilkbahar, yaz ve sonbahar besin bileşenleri, feçeslerinin (n=37) analizi ile incelenmiştir. Besin çoğunlukla habitat ve av bulunmasına bağlı olarak *Microtus guentheri* ve üzüm (*Vitis* sp.)'den oluşmaktadır. Ayrıca, Türkiye çöl sıçanı (*Meriones tristrami*), kuş tüyleri, mayıs böcekleri (*Melolontha* sp.), kayısı (*Prunus* sp.) ve böğürtlen (*Rubus* sp.) de feçeslerde düşük miktarda tespit edilmiştir.

Anahtar kelimeler: Besin tercihi, feçes, *Vulpes vulpes*, Orta Anadolu, Türkiye

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Introduction

Red fox, *Vulpes vulpes* L., 1758 is one of the most widespread carnivore distributed in all over the world except Iceland, the Arctic islands, some parts of Siberia and in some extreme deserts (Macdonald and Barret 1993, Wozencraft 2005). The diverse diet of red fox allows it to survive in distinct habitats and is considered as an omnivorous, generalist predator by various authors (Doncaster et al. 1990, Lanszki 2005, Dell'arte et al. 2007). To date many studies on food selection of *Vulpes vulpes* have been achieved. The diet is composed of mammals, birds, hares, lagomorphs, insects, other invertebrates such as earthworms, reptiles, fishes, molluscs, plants and fruits as well as domestic stocks (Doncaster et al. 1990, Lanszki 2005, Dell'arte et al. 2007, Ferrari and Weber 1995, Cavallini and Volpi 1995, Weber 1996, Baltrūnaitė 2001, Stuart and Stuart 2003, Sidorovich et al. 2006).

The aim of this research was to make a contribution to the spring, summer and autumn diet preference of red foxes, distributed adjacent to the urban settlement in Central Anatolia.

Materials and Methods

Study area: This research was carried out in the steppe areas of Keskin (39°40' 25.68" N 33° 36' 45.72" E), Balıışeyh (39°54' 44.28" N 33° 43' 11.28" E) and Delice (39°56' 48.41" N 34° 01' 57.03" E) districts of Kırıkkale province (Fig. 1).

Fresh faeces were collected from the study area between March and October 2002. Faeces were transferred to the laboratory in locked plastic bags, numbered each, then were oven dried at 37°C approximately for 48 hours. The technique of Webb (1976) was used for examination of the faeces. Each was weighed and its components was determined under a binocular microscope. Remains were counted carefully and divided into five groups: invertebrates, fruits, rodents, bird feathers and

unidentified plant remains completely digested. Bird feathers was not identified to a taxon level. Vertebrate, invertebrate remains were identified according to the collection materials at the Zoological Museum, University of Kırıkkale.

Results

The study area is covered forests including oak and juniper trees predominated. Grain, sugarbeet, sunflower and grape are the main products of the cultivated gardens (Altın 1999). In Kırıkkale, red fox prefers to occur in steppe areas covered with bushes as well as in valley of the Kızılırmak river. The diet of red fox in the study area in spring, summer and autumn is primarily composed of fruits (57.46%), mammals (31.91%), birds (4.25%), insects (2.13%) and unidentified plant items (4.25%) (Fig. 2).

Guenther's vole (*Microtus guentheri* Danford and Alston 1880) and grape (*Vitis sp.*) are found to be the main foods in respect to vineyards abundance and vole availability in the habitat in spring and summer. Furthermore, Tristam's jird (*Meriones tristrami* Thomas 1892), bird, cockchafer (*Melolontha sp.*), apricot (*Prunus sp.*) and blackberry (*Rubus sp.*) were also determined. According to the local people in this area, in autumn and winter, red foxes also fed on garbage and domestic stocks as hens, geese and turkeys. We did not encounter items of domestic stocks in the faeces collected in autumn.

Discussion

Food preference of red fox has been studied in distribution area of the species by various authors and composition of the diet is found to change from area to area (Fig. 3).

In the diet of red fox from Switzerland (Ferrari and Weber 1995) wild fruits were the main food in autumn and winter although in Turkey wild fruits (*Vitis sp.*, *Prunus sp.*, *Rubus sp.*) were found to be main food in the spring and summer diet of the species. In addition,

mustelids, water voles, hares and lagomorphs as well as insectivores, reptiles, frogs, fishes, molluscs were important preys of the red fox in all studied areas (Doncaster et al. 1990, Lanszki 2005, Dell'arte et al. 2007, Ferrari and Weber 1995, Cavallini and Volpi 1995, Weber 1996, Baltrūnaitė 2001, Stuart and Stuart 2003, Sidorovich et al. 2006). On the contrary, we did not encounter those mammals, vertebrates and invertebrates in the faeces in Central Anatolia. These dissimilarities were probably due to the climate, habitat and abundance of the preys in the study areas. With examining more faeces from all regions of Turkey, the diet composition of red fox distributed in Turkey, will be completely figured out in later studies.

References

- Altın Y, 1999. Kırıkkale'99. Government of Kırıkkale. Çetin Ofset A.Ş., Ankara [In Turkish].
- Baltrūnaitė L, 2001. Feeding habits, food niche overlap of red fox (*Vulpes vulpes* L.) and pine marten (*Martes martes* L.) in hilly moraine highland, Lithuania. *Ekologija (Vilnius)* 2: 27–32.
- Cavallini P and Volpi T, 1995. Biases in the analysis of the red fox *Vulpes vulpes*. *Wildl Biol* 1: 243–248.
- Dell'arte GL, Laaksonen T, Norrdahl K and Korpimäki N, 2007. Variation in the diet composition of a generalist predator, the red fox, in relation to season and density of main prey. *Acta Oecol* 31: 276–281.
- Doncaster CP, Dickman CR and Macdonald DW, 1990. Feeding ecology of red foxes (*Vulpes vulpes*) in the city of Oxford. *England J Mammal* 71: 188–194.
- Ferrari N and Weber JM, 1995. Influence of the abundance of food resources on the feeding habits of the red fox, *Vulpes vulpes*, in western Switzerland. *J Zool* 236: 117–129.
- Lanszki J, 2005. Diet composition of red fox during rearing in a moor: a case study. *Folia Zool* 54 (1–2), 213–216.
- Macdonald DW and Barret P, 1993. Mammals of Europe. Princeton University Press., Princeton.
- Sidorovich VE, Sidorovich AA and Izotova IV, 2006. Variations in the diet and population density of red fox *Vulpes vulpes* in the mixed woodlands of northern Belarus. *Mammal Biol* 71: 74–89.
- Stuart CT and Stuart TD, 2003. Notes on the diet of red fox (*Vulpes vulpes*) and Blanford's fox (*Vulpes cana*) in the montane area of the United Arab Emirates. *Canid News* 6: 4.
- Webb JB, 1976. Otter Spraint Analysis. Mammal Society Publication, London.
- Weber JM, 1996. Food selection by adult red foxes *Vulpes vulpes* during a water vole decline. *Wildl Biol* 2: 283–288.
- Wozencraft WC, 2005. Carnivora. In: Mammal species of the world (eds. DE Wilson and D Reeder). The Johns Hopkins University Press, Baltimore, pp. 532–628.

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Figure 1. The study area of red fox in Kırıkkale province, Central Anatolia

Figure 2. Frequency of plant, invertebrate and vertebrate items in the diet of red fox in Central Anatolia

Figure 3. Comparison of diet components frequency data of red foxes in England, Italy, Switzerland, Hungary, Lithuania and Turkey

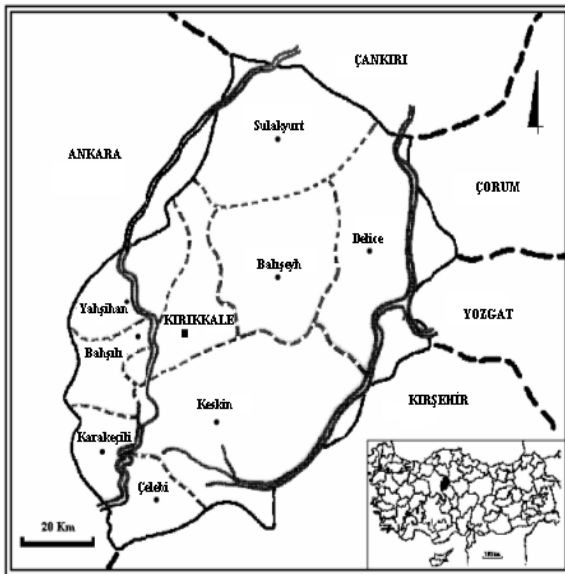


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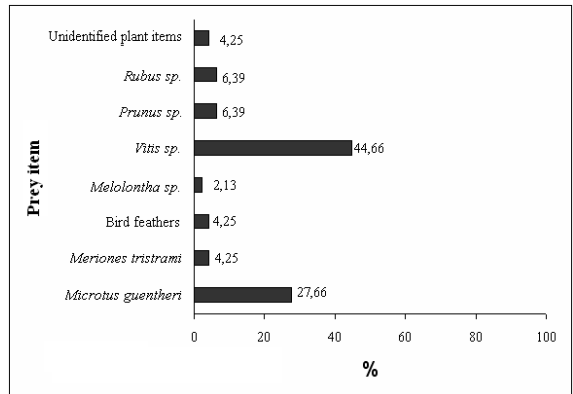


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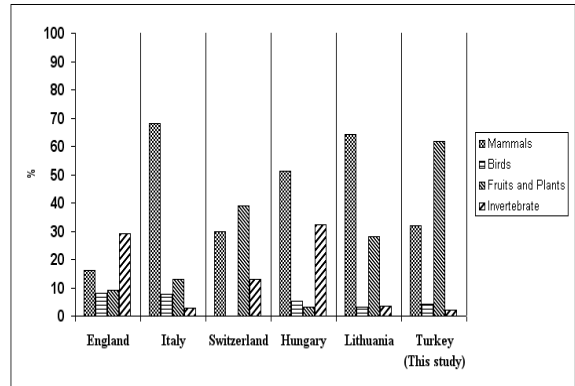


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