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FOOD HABITS OF *TATERA INDICA* IN A WHEAT, SUGARCANE, AND FODDER BASED AGROECOSYSTEM

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This paper describes the diet of *Tetrea indica* in the agroecosystem of central Punjab where wheat, sugarcane, and fodders are dominant crops. Cereals (viz., wheat, sorghum, and millet) together with *Chenopodium*, lucern, and *Spergula* were the main constituents of the diet of *T. indica* captured from wheat, sugarcane, cotton, and fodder crops as well as from farm and village houses. On average, wheat constituted more than 50% of the rat's diet. Although seeds of plants predominated the rat's diet, yet stems and leaves were also eaten in fairly good quantities.

INTRODUCTION

The Indian gebril or the antelope rate *(Tatera indica)* ranges from India through Pakistan, Iraq, Iran, Syria (Walker *et al.*, 1964). In Pakistan, it occurs in all the four provinces and is most common in the Indus Plain (Roberts, 1977). The gebril has broad ecological niche and infests agricultural fields in fairly good numbers (Prasad, 1954; Beg *et al.*, 1977). Introduction of canal irrigation at the turn of present century seems to have enabled the gebril to extend its range from river banks to farmlands of canal colonies (Taber *et al.*, 1967). In some villages, it has become commensal (Roberts, 1977).

The present paper documents information about the diet of the rat in the agroecosystem of central Punjab in which wheat, sugarcane and fodders are dominant crops.

MATERIALS AND METHODS

Specimens of *T. indica* were snap-trapped from August, 1988 to April, 1990 from a variety of farm crops as well as from farm and village houses of central Punjab. Reference slides of different parts of 26 candidate food plants collected from the fields were prepared to facilitate identification of food particles present in the stomachs of the captured specimens. Microscopic slides of reference material and the stomach contents were prepared following Williams (1962) and Ward (1970). Ten fields from each of the slides were examined under 60 x magnification of a microscope to determine the frequency of occurrence and relative density of each of the food items. Per cent dry weight of the individual items was calculated following Williams (1962) and Ward (1970). For assessing habitat-related diversity in the rat's diet, Berger-Parker index was used.

RESULTS

The specimens of contents of 91 stomachs of the antelope rat *(Tatera indica)* captured from fodder (12 specimens), wheat (12 specimens), and cotton (17 specimens) fields, and from farm (45 specimens) and village (5 specimens) houses were examined. On the whole, seed, stems, and/or leaves of 21 species of plants were consumed by these specimens.

Table 1. Diet of *Tetera indica* in relation to habitat

Food items	Dry weight (%)					
	Fodder (n = 120)	Wheat (n = 120)	Cotton (n = 170)	Farm houses (n = 450)	Village houses (n = 50)	Total
Wheat	29.20	65.65	40.78	56.98	95.45	53.45
Lucern	3.61	3.05	5.91	2.94	0.00	3.45
Trifolium alexandrinum	0.00	3.05	1.32	1.96	0.00	1.72
Chenopodium album	5.84	10.69	4.61	4.90	0.00	6.03
Chenopodium murale	8.03	0.00	3.95	5.88	0.00	4.31
Sugarcane	2.19	1.53	1.32	3.92	0.00	2.59
Sorghum	21.17	0.00	19.10	2.94	0.00	7.76
Brassica compestris	0.00	0.76	0.00	1.86	0.00	0.86
Coriander	0.73	2.29	0.00	1.96	0.00	1.72
Spergula rubra	2.19	9.16	3.29	1.96	0.00	3.45
Euphorbia helioscopia	0.73	1.53	1.97	0.00	0.00	0.86
Portulaca oleracea	1.46	0.00	0.00	0.00	0.00	-
Avena sativa	0.00	0.00	0.00	0.98	0.00	-
Gram	0.00	0.00	0.65	3.92	0.00	1.72
Rice	2.95	0.00	3.95	2.94	1.52	2.59
Trigonella foenum graecum	1.46	0.00	0.65	0.00	0.00	-
Millet	15.33	0.00	5.92	0.00	0.00	3.45
Maize	0.00	0.00	0.00	0.98	0.00	0.86
Pulses	0.00	0.00	2.63	0.00	0.00	0.86
Phalaris minor	0.73	0.00	0.00	0.98	1.52	0.86
Sonchus	0.00	0.76	1.32	0.00	0.00	-
Animal matter	0.00	0.00	0.00	1.96	0.00	0.86
Unidentified	4.38	1.53	2.63	2.94	1.52	2.59

n = Number of oculars examined.

In the rats captured from the fodder fields, wheat (29%), sorghum (21%), millet (15%), and *Chenopodium* (14%) were the staples of their diet as they jointly constituted 79% of the total weight of the contents (Table 1). In rats from wheat fields, wheat (66%), *Chenopodium* (11%), and *Spergula rubra* (9%) accounted for 86% of the weight of the stomach contents. The cotton field rats were relatively less dependent on wheat as they had a relatively more diversified diet comprising mainly wheat (41%), sorghum (19%), *Chenopodium* (9%), leguminoid fodders (7%), millet (6%), and rice (4%).

These together constituted 86% of the total diet of the rat (Table 1).

The farm house antelope rats had a more diversified diet as compared to those of the village house rats. The former fulfilled their nutritional requirements by consuming wheat (57%), *Chenopodium* (11%), leguminoid fodders (5%), sugarcane (4%), sorghum (3%), gram (4%), and rice (3%). In specimens from village houses, wheat alone accounted for 95% of the total weight of the rat's diet (Table 1).

On the whole, wheat (54%) was the most important component of the diet. Other important staples of the diet were *Chenopodium* (10%), sorghum (7%), leguminoid fodders (5%), millet (4%), *Spergula rubra* (4%), sugarcane (3%), and rice (3%) which jointly accounted for 36% of the total weight of the rat's food.

tance eaten by the rats were included millet, rice, gram, brassica, maize, and pulses.

Stems of ten species of plants were eaten: wheat, sorghum, leguminoid fodder plants, and sugarcane being the main contributors.Wheat stems were best consumed during the spring season, whereas sorghum and sugarcane during the fall season, and stems of leguminoid fodders during the winter season were the main staples (Fig. 1).

Plant leaves, which were eaten round the year, constituted a fairly good part of the diet. In all, leaves of 11 species of plants were consumed. Leaves of *Chenopodium, Spergula,* lucern and coriander were among the best consumed ones. Roots of plants and animal food were consumed only sparingly.

Food diversity: Figure 2 shows that the rats taken from the fodder crops had the most varied diet as they exploited a wide variety

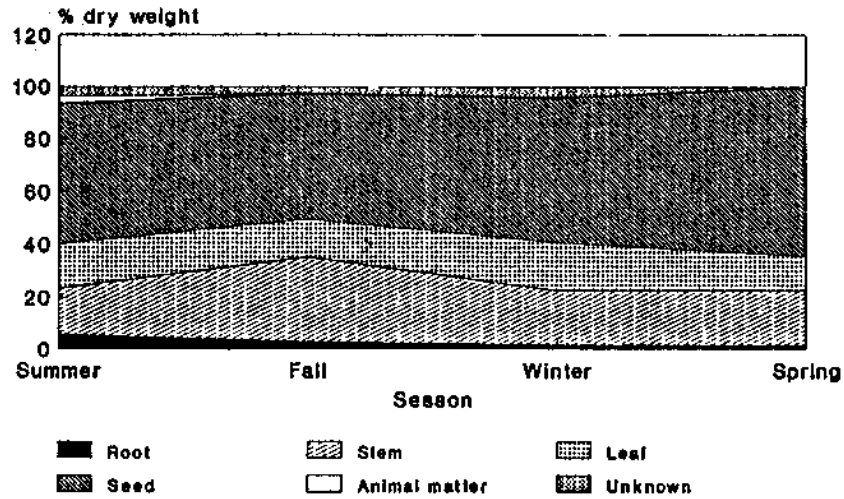

Fig. 1. Proportion of different parts of plants consumed by *Tatera indica* during four seasons of the year.

Parts of the plants consumed: Seeds of 10 species of plants were best consumed by the rats. Wheat was eaten intensively during all the four seasons of the year (Fig. 1). Among other plant seeds of the economic impor-

of foods. The diet of the cotton and farm house rats was less diversified, that of the wheat field rats even less diversified, and that of the village house rats was the least diversified.

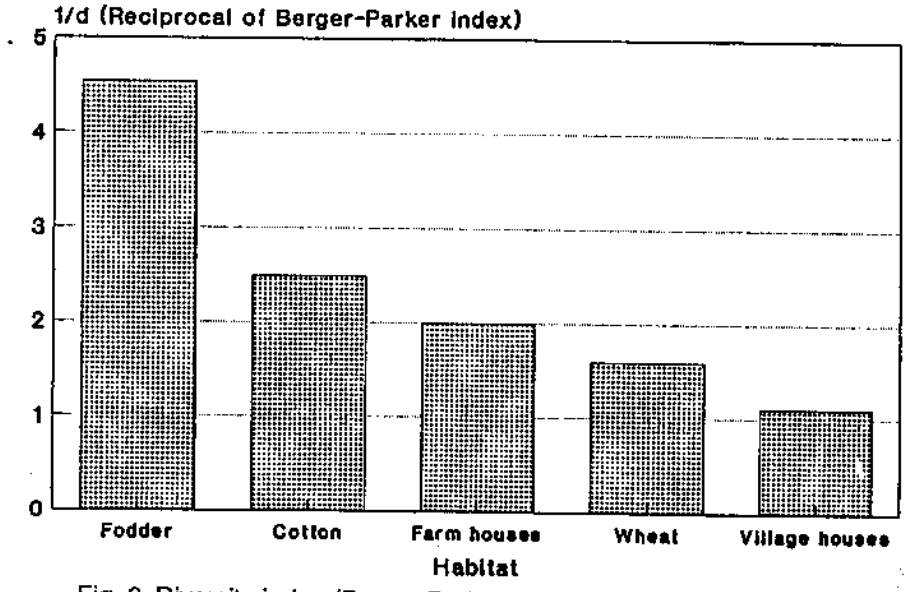

Fig. 2. Diversity index (Berger-Parker index) for stomach contents of *Tatera indica* taken from different habitats.

DISCUSSION

In the wheat, sugarcane and fodder dominated agroecosystem of central Punjab, *T. indica* heavily depended on wheat for its food. Other food items which contributed significantly to the diet of the rat were sorghum, *Chenopodium*, lucern, *Spergula*, and millet. The intensity of exploitation of different food resources depended on their availability. In specimens captured from fodder, wheat, *Chenopodium*, millet and lucern were intensively eaten items. In wheat field rats, wheat was the main staple of the diet which was supplemented by *Chenopodium*, *Spergula*, and leguminoid fodders. Cotton field rats mainly depended on wheat, sorghum, millet, *Chenopodium*, and leguminoid fodder crops for their food. Maximum dependence on wheat was observed with respect to the village house rats.

It is of interest to note that sugarcane is the second major crop of the present study area. In spite of this fact, sugarcane constituted only an insignificantly small portion of the rat's diet; only 3% of the annual diet was due to this particular item. In the cane fields of the lower Sindh too the rat seldom ate cane, but frequently ate cereals or seeds of *Chenopodium*. Among the cereals, wheat was the main item (Smiet *et al.*, 1980). Rice too was consumed in small quantities at both the places, namely, lower Sindh and central Punjab. Sultana (1983) reported that in the croplands of central Punjab the rat's diet during fall and winter seasons comprised mainly of sugarcane, wheat, *Sonchus* and lucern leaves. The data of the present study indicate that both sugarcane and *Sonchus* constituted an insignificantly small portion of the diet of the rats during the fall and winter seasons. According to Ismail (1987), millet, wheat, and maize constituted the main staples of *T. indica* diet in late spring and summer in central Punjab. In the present study area, millet and sorghum made a sizable part of the diet of *T. indica* in summer and fall, but wheat was the most intensively consumed item.

Thus, it may be concluded that cereals

(such as wheat, sorghum, and millet) together with *Chenopodium*, lucern, and *Spergula* were the main constituents of the diet of *T. indica* of the agroecosystem of central Punjab. Among cereals, wheat on average met more than 50% of the dietary requirements of the rat. Furthermore, the rat was not purely a granivore because stems and leaves were also eaten in fairly good quantities.

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