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FOOD AND FEEDING BIOLOGY OF THE CHEER PHEASANT *CATREUS WALLICHI* AT BINGARH VALLEY, GARHWAL HIMALAYA, INDIA

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ABSTRACT

Faecal analysis of Cheer pheasant was carried out to (January 2020 to December 2020) identify the diet composition. Both plant and animal matters along with fine organic matter + grits were recorded in the faeces of Cheer. Plant matter constituted a major portion of the faecal content (77.26 ± 1.27) and represented 24 species belonging to 10 families. Non vegetative matter was recorded about 6.32 ± 0.63 of dry weight which represented 05 orders of the arthropods. Fine organic matter + grits constitute 15.32 ± 0.59 of the faecal contents and recorded during all months of the study. Roots and tuber of *Cajanus*, *Crotalaria*, *Vigna* bulbs of *Desmodium* and fruits of *Rhus Parviflora* were identified as important diet of Cheer pheasant.

Key words: Faecal analysis, Cheer Pheasant, Plants and Arthropods, Garhwal Himalaya.

INTRODUCTION

The knowledge of food and feeding habit is prerequisite for effective management of an animal species in the wild as well as captivity. Study of the feeding biology is important to understand the relationship between animal and food items and their animals. A good correlation between diet and undigested faecal contents is observed in many game birds (Eastman and Jenkins, 1970, Butterfield and Coulson, 1975; Yonzon and Lelliot, 1981, Marti 1982, Bhandari et.al. 1986 and Bergstron, 2013). Cheer pheasant *Catreus wallichi* which is a threatened game bird of the Himalayan chir-pine forest feeds upon leaves, fruits, seeds, roots, tuber and Insects (Hume and Marshall 1879 and Ali and Ripley, 1983). In the Garhwal Himalaya, Bisht et.al. (2007) reported diet of cheer pheasant but this information is still very limited. In Present Paper, we conducted micro-histological analysis of the faeces of Cheer pheasant and identify the diet.

MATERIALS AND METHODS

Intensive study conducted on feeding biology of Cheer pheasant at Bingarah valley, Garhwal Himalaya, the faecal samples were collected from roosting trees. The study area was located at $30^{\circ}26'N$ latitude, $79^{\circ}10'E$ longitude and 1660 m. altitude, and comprised by a mixed temperate forest (*Quercus*, *Rhododendron*, *Myrica*, *Pinus roxburghii* etc.). The faecal samples collected in every month were stored in sealed plastic bags, kept in oven at $60^{\circ}C$ to remove residual

moisture. The faecal samples were soaked in water from 3-5 days, and then sieved through a 212 μm mesh for analysis (Moreby, 1993). The material retained on the sieve after gentle washing was stored in 70 percent alcohol. Small amount of these retained samples was evenly distributed on 10cm. petri dish scored with 1cm² grid and examined under a polarized light microscope at 100X. Microphotographs at different magnification (20X, 50X, 100X) of each undigested food fragments were taken and identified with the help of text (Sharp, 1968a and b, Warburton, 1968) photographic acids (Satakopan, 1972, Ralph et.al. 1985 and Moreby, 1993) and reference slides prepared from the herbarium and insect samples collected from study site. Estimates of Plant and arthropod contents in the faeces are presented as mean percentage (Monthly, Seasonal and Annual) and mean dry weight percentage (Monthly). Data was analyzed by using one way ANOVA. The four seasons were defined as winter (Nov. to Jan.), Spring (Feb. to April), Breeding (May to July), Monsoon and Post monsoon (Aug. to Oct.).

RESULT

Dry weight of the 123 faecal samples (droppings collected from roosting trees ranges from 1.21 ± 0.03 (during August to 1.63 ± 0.06 gram (during January), with an annual mean (pooled mean group weight) of 1.37 ± 0.08 gram. The micro histological examination of the droppings results that the diet of Cheer pheasant comprises both vegetative (plants) and non –vegetative (animal matter) along with grits. The faecal contents were grouped into three main categories viz. **a) vegetative diet:** plants (divided into 10 families namely *Anacardiaceae*, *Asteraceae*, *Berberidaceae*, *Fabaceae*, *Malvaceae*, *Poaceae*, *Saxifragaceae*, *Plumbaginaceae*, *Rosaceae* and *Urticeae* **b) arthropods** (divided into 5 orders, viz. Orthoptera, Coleoptera, Diptera, Dicoptera, Lepidoptera and unidentified arthropods and **c) fine organic matter+grits**. The vegetative parts, fragments of leaves, seeds, fruits, roots, fibers and grass of about 20 species were recorded in faeces of Cheer pheasant through histological analyses. The pants constitute a major part (mean dry weight) of the faecal contents ranging from 68.38 ± 1.21 (July) to 85.13 ± 1.96 during December while a considerable amount of fine organic matter and grits (9.23 ± 0.31 to 19.42 ± 0.72) was also recorded throughout study period. Percent of fine organic matter and grit was found low from October to December but in April to June it was quite high. Various fragments of arthropod body parts, viz., mandibles, leg, wings, larvae, mouth parts and unidentified fragments were encountered in all months of study period in faeces of Cheer. Highest mean dry weight percent of 13.43 ± 0.81 (in July) and lowest 1.33 ± 0.16 was recorded during the month of January to February respectively (Table). In annual mean frequency of plants, through higher mean frequency 77.54 ± 7.49 (*Fabaceae*) was observed over that of 40.58 ± 3.89 (*Poaceae*), *Asteraceae* (39.90 ± 4.84), *Rosaceae* (39.30 ± 5.21), *Saxifragaceae* (31.62 ± 3.01), *Berberidaceae* (27.49 ± 3.52), *Anacardiaceae* (21.89 ± 2.52), *Malvaceae* (19.35 ± 2.86), *Plumbaginaceae* (17.61 ± 2.25) and *Urticeae* (17.46 ± 2.81). Similar pattern was observed in mean frequency percent occurrence of arthropods during January 2020 to December 2020. Through higher mean frequency 24.87 ± 3.52 (Diptera) was observed over that of the Lepidoptera (24.51 ± 3.09), Coleoptera (24.40 ± 2.92), Orthoptera (23.15 ± 2.55), Dicoptera (19.84 ± 2.38) with identification parts (20.02 ± 3.0) and Grits and stone (20.88 ± 3.27) respectively.

DISCUSSION

The study of food habits of wild birds is of great importance for management and conservation point of view. Through faecal analysis, food and feeding biology of Galliformes was studied by many workers like calling (1918), Browne and Aebischer (2003), Hill (1985), Hammer et.al. (1958), Bhandari et. al. (1986) who established and good correlation between the gut contents and remains of undigested food eliminated out along with faeces. Phurailatpam et.al. (2005) and Bisht et.al. (2007) studied feeding biology of Cheer pheasant and identified grasses, leaves, forbs, seeds, fruits,

root/tubers and grains as main dietary elements. In addition to vegetative food, the arthropods were found as important diet of Cheer. Because their remain in the faecal matter/ droppings were recorded throughout the year. The fragments of arthropods considerably recorded maximum during breeding period showing the importance of energy rich protein diet as insect in reproduction of pheasant. Remain of flies (Dipterans), grasshoppers (Orthoptera) from the main bulk of annual mean percent of arthropods contents. Relatively, the higher abundance of Dipterans and Orthopterans over other groups of arthropods show that flies and grasshoppers are important insect consumed by Cheer. Ridley and Islam (1987) and Birdlife International (2001) also reported grasshoppers as important food of Cheer pheasant in Pakistan. Coccinella and ants parts recorded as faecal contents as in many other birds (Sathyakumar, 1992, Waloff and Blackith, 1962). Many studies have shown that arthropod in diet can vary significantly depending not only on the species of the game birds studied but also on seasonal and localized abundance of arthropods (Green, 1984, Rands, 1985, Hill, 1985, Moreby, 1993). Garson et.al.(1992) categorized Cheer under the group of pheasants with seeds, root and fruits as primary food in addition to leaves. Based on findings of present study, it could be concluded that both vegetative (plants + grains) and non-vegetative parts (arthropods) constitute diet of Cheer and consumption of particular food depends on seasonal availability. *Rhus*, *Rubus*, *Berberis*, *Rosa* and *Rumax* were identified as important dietary elements of Cheer. Leaves, flower, fruits and seeds of this vegetation consumed throughout the year. A better understating of wild Cheer diet is important area of study for management point of view, and this attempt provides intensive qualitative knowledge on food and feeding behaviour of the wild Cheer pheasant for first time at this region.

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Table 4.2. Monthly dry weight percent of (Plant, arthropods and F.o.m. + grits) component of faecal contents with corresponding sample size and weight of Cheer pheasant at Bingarh valley, Garhwal Himalaya

Month	Sample size	Faecal (in gram)	Arthropod (in %)	Plant (in %)	Fine o. m. + grits (in %)
January	9	1.63±0.06	1.33±0.16	80.73±1.23	16.87±0.83
February	11	1.42±0.06	1.96±0.42	81.41±1.42	14.52±0.81
March	10	1.29±0.09	2.23±0.72	79.91±0.93	17.20±0.82
April	11	1.33±0.04	8.82±0.96	71.23±0.71	19.42±0.72
May	12	1.40±0.06	8.71±0.83	73.20±0.96	17.42±0.59
June	10	1.52±0.21	7.86±0.58	75.82±0.96	14.50±0.29
July	12	1.33±0.08	13.43±0.81	68.38±1.21	17.35±0.71
August	8	1.21±0.03	8.82±0.71	75.73±0.93	14.57±0.69
September	10	1.43±0.09	11.21±0.92	70.82±1.42	16.73±0.67
October	9	1.29±0.08	5.78±0.68	82.72±1.94	9.23±0.31
November	11	1.24±0.05	3.39±0.52	82.02±1.57	14.05±0.42
December	10	1.42±0.09	2.27±0.22	85.13±1.96	12.03±0.21

Table 4.4. Percent frequency occurrence of different plants families in faecal samples of Cheer pheasant at Bingarh valley Garhwal Himalaya

Familiy	Winter	Spring	Summer	Monsoon	Annual
Anacardiaceae	3.82±0.82	25.70±2.40	35.72±4.72	22.31±2.13	21.89±2.52
Asteraceae	41.31±4.24	42.51±7.20	57.59±5.40	18.20±2.93	39.90±4.84
Berbridaceae	15.21±1.92	36.81±4.92	19.92±2.90	38.02±4.42	27.49±3.52
Fabaceae	71.21±7.21	56.23±5.76	88.80±7.80	93.93±9.20	77.54±7.49
Malvaceae	25.01±3.71	22.27±2.60	20.21±2.87	9.93±2.28	19.35±2.86
Poaceae	42.32±2.23	43.20±4.20	49.20±5.20	27.60±3.92	40.58±3.89
Saxifragaceae	10.20±0.93	41.20±3.32	23.20±2.98	51.90±4.80	31.62±3.01
Plumbaginaceae	9.93±0.72	38.20±5.10	12.20±2.20	10.12±0.98	17.61±2.25
Rosaceae	33.10±3.20	50.12±6.62	49.20±6.62	24.80±4.41	39.30±5.21
Urticeae	13.32±2.81	11.12±0.93	24.20±4.20	21.20±3.31	17.46±2.81

Table 4.6. Percent frequency occurrence of arthropods/orders in faecal samples of Cheer pheasant at Bingharh valley Garhwal Himalaya

Order	Winter	Spring	Summer	Monsoon	Annual
Orthoptera	20.62±2.28	23.25±2.42	26.53±3.32	22.20±2.20	23.15±2.55
Coleoptera	22.52±3.09	24.15±3.32	28.10±3.20	22.83±2.08	24.40±2.92
Diptera	19.67±3.15	26.20±3.51	25.93±2.42	27.70±5.02	24.87±3.52
Dicoptera	15.57±2.04	21.72±2.28	23.15±2.24	18.92±2.98	19.84±2.38
Lepidoptera	18.83±4.03	25.67±2.27	28.05±2.23	25.50±3.82	24.51±3.09
Unidentified	17.84±2.23	20.70±3.32	21.63±3.30	19.94±3.15	20.02±3.0
Grits/Stone	20.02±3.15	22.57±3.92	21.07±2.83	19.87±3.20	20.88±3.27

