

SEX RATIO OF WINTERING WATERFOWL AT SELECTED WATERBODIES IN NORTHERN SUBURB OF SECUNDERABAD, ANDHRA PRADESH

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Abstract

Sex ratio of wintering waterfowl was studied in selected waterbodies in northern suburb of Secunderabad during winter season from 1993-94 to 1996-97. Imbalance in sex ratio was observed in Shoveller and Pintail (male biased), Gadwall and Wigeon (1:1), and Common Teal (female biased). Among the species studied, the number of males per 100 females in population varied between 65.24±1.83 (Common Teal) and 222.15±0.003 (Shoveller).

Key Words

Sex ratio, waterfowl, Secunderabad, tanks

Introduction

Annually, 14 species of waterfowl winter regularly at lesser-known waterbodies in and around the twin cities of Hyderabad and Secunderabad in Andhra Pradesh, India. Variation in occurrence of species and their numbers at these tanks is under the direct influence of factors including the degree of human disturbance, pollution and eutrophication levels. Regular attempts have been made to document the bird diversity of these tanks. To this effect, our study (Srinivasulu *et al.*, 1996) has revealed that the lesser known smaller waterbodies in the northern suburb of Secunderabad act as important winter refuge to at least 13 species of Anatidae. Eutrophication and pollution were found to be the main threats to these waterbodies. However, species composition and diversity were recorded to be highest at waterbodies that are under high pressure of threats (Srinivasulu & Srinivasulu, in press) and this was mainly accredited to factors as availability of suitable habitat, dietary items and disturbance factors (Srinivasulu *et al.*, 1996).

Sex ratio variation among the sexually dimorphic waterfowl wintering at waterbodies lying within the co-ordinates 17°30'–17°41'N and 78°24'–78°31'E in northern suburb of Secunderabad during the winter seasons from 1993-94 to 1996-97 is presented here. Table 1 gives the salient features of the study tanks (for further details refer Srinivasulu *et al.*, 1996).

Materials and Methods

Fortnightly surveys were carried out to record the species and number of individuals of waterfowl visiting the study tanks. All observations were made in mornings between 0630 and 1000 hours and males and females of only sexually dimorphic waterfowl were counted either from vantage points or walking on dykes. Though the waterfowl counts began during October each year, sexual dimorphism among the waterfowl was evident only by December or January when they develop breeding plumage.

Sex ratio was calculated following Caughley (1980) with 95 per cent confidence limits (Riney, 1956) following the formula:

$$\pm 200 (Mn/F^3)$$

where, 'M' stands for total number of males in a population, 'n' stands for number of observations, and 'F' stands for number of females in a population.

Results and Discussion

Migratory waterfowl start arriving by the second half of September. As mentioned earlier, of the 13 species that winter in the northern suburb of Secunderabad, five species, namely, the Pintail (*Anas acuta* L.), Common Teal (*Anas crecca* L.), Gadwall (*Anas strepera* L.), Wigeon (*Anas penelope* L.), and Shoveller (*Anas clypeata* L.) are sexually dimorphic. The overall sex ratio

Table 1. Salient features of the study tanks

Name	Location	Area (in ha.)	Remarks
Medchal Pedda Cheruvu	17°35' N 78°29' E	22 to 24	Agriculture on fringes, human dwellings, cultural eutrophication has led to loss of 35-40% water-spread area. Fishing rampant and industrial pollution.
Medchal Voora Cheruvu	1km northwest of above tank	12 to 14	Human dwellings, cultural eutrophication, 65-75% water-spread covered by Ipomoea.
Railapur Cheruvu	17°37' N 78°26' E	24 to 26	Agriculture on fringes, cultural and natural eutrophication, 65-70% loss of water-spread area.
Athvelly Cheruvu 78°29' E	17°39' N	26 to 28	Agriculture on fringes, good stand of trees, cultural and natural eutrophication leading to 40-45% coverage of water-spread area
Gundla Cheruvu	17°31' N 78°28' E	26 to 30	Agriculture on fringes, cultural and natural eutrophication, loss of 25-30% water-spread area
Dhulapally Cheruvu	17°32' N 78°27' E	24 to 26	Agriculture on fringes, human-induced disturbances are high.

indicates towards the preponderance of males in the population.

Sex ratio of each species in individual study tanks is depicted in Table 2. Maximum disparity in sex ratio was noted in Shoveller followed by Pintail where it was male biased. Sex ratio was balanced in the cases of Gadwall and Wigeon, while it showed a higher per cent of females in case of Common Teal. A similar trend was observed by Bhupathy *et al.* (1998) in Keoladeo National Park, Bharatpur.

Proportion of males per 100 females of these five species in northern suburb of Secunderabad showed a similar trend (Table 3). Unlike in Keoladeo National Park, here, higher disparity in sex ratio towards males was found among Shoveller followed by Pintail. This might be due to displacement of females by male aggression to use of resources and habitat (Hepp & Hair, 1984; Oring & Lank, 1982). Alexander (1983) reported a similar trend of behaviour of male dominance in Canvasback and Ring-necked

Duck.

There are many theories that discuss the worldwide phenomenon of disparity in sex ratio in waterfowl (Johnsgard & Buss, 1956; Alford & Bolen, 1977; Bennet & Bolen, 1978; Alexander, 1983). Some of the important theories that discuss the imbalance of sexes in population of waterfowl in wintering grounds include

- i) the behaviour dominance theory (Hepp & Hair, 1984; Oring & Lank, 1982) – male displaces female by aggression,
- ii) pairing chronology theory (Hepp & Hair, 1984) – early pairing species have less disparity in sex ratio than the late pairing ones,
- iii) cold hardiness or stress theory (Alexander, 1983; Owen & Dix, 1986) – smaller sized females migrate further south to warmer areas.

In all study tanks where Shoveller was observed, the sex ratio

Table 2. Overall sex ratio (male:female) of sexually dimorphic wintering waterfowl at the study tanks.

Species	MD	MV	RL	AT	GD	DH	Overall
Pintail	2.01:1	-	2.05:1	2.5:1	1.74:1	1.94:1	2.04:1
Common Teal	0.59:1	0.33:1	0.72:1	0.78:1	0.62:1	0.81:1	0.65:1
Gadwall	-	-	-	1.01:1	-	1.03:1	1.02:1
Wigeon	-	-	-	1.01:1	-	0.93:1	0.98:1
Shoveller	2.18:1	-	-	2.21:1	-	2.24:1	2.22:1

MD - Medchal Pedda Cheruvu; MV - Medchal Voora Cheruvu; RL - Railapur Cheruvu; AT - Athvelly Cheruvu; GD - Gundla Cheruvu; DH - Dhulapally Cheruvu.

Table 3. Sex ratio (males per 100 females) of sexually dimorphic wintering waterfowl at the study tanks

Species	Males per 100 females
Pintail	204.00 +/-0.13
Common teal	65.24 +/-1.83
Gadwall	102.39 +/-8.42
Wigeon	98.07 +/-9.65
Shoveller	222.15 +/-0.003

was in favour of males indicating that the males might have aggressively excluded the females, as food resources seemed to be limited in light of high densities of birds. Pintail, like the Shoveller, is a late pairing bird species, hence a disparity in their sex ratio was evident. However, with respect to Common Teal (also a late pairing species), a balanced sex ratio validates the cold hardiness or stress theory (Bhupathy *et al.*, 1998). The study tanks being located in relatively warmer region of the sub continent have more numbers of female individuals of this species than males. We find that there exists a synergetic relationship between various factors related to above-mentioned theories and disparity of sex ratio in wintering waterfowl in northern suburb of Secunderabad.

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