TREE SPECIES SELECTION FOR ROOSTING BY HOUSE SPARROW (*PASSER DOMISTICUS)* IN RAJKOT, GUJARAT

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Abstract: House sparrow (*Passer domisticus*) became one of the widely spread and abundant species by following man throughout the world. Current research mainly focuses to know the criteria of roost tree selection by house sparrow. Total 20,272 sparrow population was recorded during study period October 2013 to October 2014 at Rajkot (Lat. 22° 18' N to Long. 70° 47' E).Total 34 roosting sites were identified among them 16 roosting trees were selected for measurement having good (1000 to 2000 and > 2000), moderate (100 to 1000) and lower (0 to 100) population. Among these 16 sites were selected for tree measurements having different category of population i.e. 0-100, 100-1000, 1000-2000 and >2000. Tree characteristics i.e. tree height, canopy height, canopy width and GBH were measured. House sparrows were observed to roost mainly on Ashoka tree (*Polyalthia longifolia*), Jujube tree (*Ziziphus jujube*), Devil tree (*Alstromia scholaris*), Mesquite (*Prosopis juliflora*). Among these, *Prosopis juliflora* was the dominant tree species. Sparrows did not prefer trees having larger canopy width and tree height. Sparrows were preferred to roost on trees having tree height ranging from 3 to 12 m, GBH from 30 to 150 cm, canopy height from 2 to 8 m and canopy width from 10 to 35 m trees and shrub type trees. House sparrows preferred to roost on spiny trees such as Mesquite (*Prosopis juliflora*), Jujube tree (*Ziziphus jujube*) and Tamarind tree (*Tamarindus indica*). Sparrows were observed to roost on trees having larger canopy height which was almost half of the total height of the tree.

Keywords: House Sparrow, *Prosopis juliflora*(Mesquite), Rajkot, Roosting sites.

Introduction: The House sparrow (*Passer domisticus*) is a symbiotic species with human, hence recognizing and identified as bird species depended on human environment. House sparrow populations have been declining in many parts of the world [2],[4],[5],[9] and specifically is slowly disappearing from urban areas [8]. Because of urbanization, once so common, the most dominant [3],[11], in the world the *Passer domisticus* have drastically declined recently. In recent years India also has seen a dramatic decline of sparrow populations. The sparrow population in Kerala, Gujarat and Rajasthan, had dropped by 20 percent [1]. Different species of birds gather to form diurnal or nocturnal mixed feeding flock breeding colonies and communal roosts [12], [6], [10], [7]. Destruction of Roosting sites' is one of the important reason of their decline. There for it is essential to find out the roosting tree selection and physical characteristics of roost trees. Most of the birds roost in groups for at least part of the year. Selection of the roosting places varies considerably. Trees are the most important places where the birds roost the current study tries to address the roost tree selection by the house sparrow.

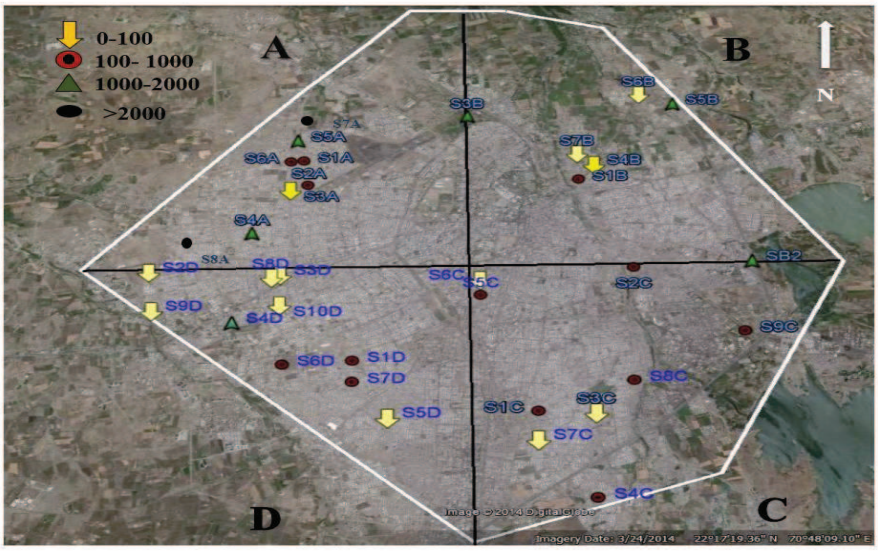


Figure 1.1 Map of study area showing thirty four roosting sites

The present work was carried out at Rajkot city (Lat. 22° 18'N to Long. 70° 47' E). Rajkot is situated in the region called Saurashtra in the Gujarat state of India. The city is spread in the area of 170 km².

Method: Study was conducted from October 2013 to October 2014. Study area was surveyed before to identify roosting sites by following the flocks of sparrows in the roost site direction. Total 20,272 house sparrow population was recorded at Rajkot. Total 34 roosting sites were identified among them 16 roosting trees were selected for measurement having good (1000 to 2000 and > 2000), moderate (100 to 1000) and lower (0 to 100) population. These 34 sites were classified according to their population i.e. 0 to 100, 100 to 1000, 1000 to 2000 and > 2000. Tree characteristics i.e. tree height, canopy height, canopy width and GBH were measured. To check whether the roosting site selection is tree species and type specific we had postulated hypothesis i.e. house sparrows require spiny, evergreen and comparatively smaller trees for roosting.

Results: House sparrows were preferred to roost on trees having tree height ranging from 3 to 12 m, GBH from 30 to 150 cm, canopy height from 2 to 8 m and canopy width from 10 to 35 m (Table1.1). Sparrows were observed to prefer trees of height of 8 m, GBH of 95 cm, canopy width of 20 m, canopy height 5m (Average) (Table 1.1). Total 8 tree species were selected for thirty four roosting sites. Maximum number of roosting sites were of Mesquite tree (*Prosopis juliflora*) (14 sites) followed by Devils tree (*Alstomia scholaris*) (8 sites) whereas lowest number of sites were of Neem tree (*Azadirachta indica*) and Tamarind tree (*Tamarindus indica*) (each with single site) (Fig. 1.2). Maximum percentage of sparrow population was observed to roosts on *Prosopis juliflora* (61%) followed *Alstromia scholaris* (17 %) whereas lowest percentage population was on *Aegle marmelos*, *Cascabela thevetia* and *Azadirachta indica* (Fig.1.3). Maximum tree height, canopy width and GBH were recorded at sites having population more than 2000 whereas population up to 100 roosting at trees having lower tree measurements (Fig.1.4).

Table 1.1 Tree measurements and sparrow population roosting at eight tree species.

Sr No	Scientific Name	English name	Type of tree	No of sites	Canopy		Tree height	GBH	Count
					width	height			
1	*Aegle marmelos*	Golden apple	*Evergreen tree*	2	13.88	3.34	5.35	74	26
2	*Cascabela thevetia*	Yellow oleander	*Evergreen shrub*	2	11.12	2.3	3.5	30	61
3	*Azadiracht a indica*	Neem tree	Evergreen tree	1	21.94	7.6	8.51	142	98
4	*Tamarindu s indica*	Tamarind tree	Spiny tree	1	23.63	4.2	6.2	89	689
5	*Polyalthia longifolia*	Ashoka tree	Evergreen tree	3	13.13	5.49	6.08	92	214
6	*Ziziphus jujube*	Jujube tree	Spiny tree	3	25.41	5.84	7.6	112	796
7	*Alstromia scholaris*	Devil tree	Evergreen tree	8	21.48	7.8	10.2	90.5	1281
8	*Prosopis juliflora*	Mesquite tree	Spiny tree	14	32.73	4.83	11.45	133	4626
Total Number of Sites				34	**Average**				**Total count**
					20.41	5.17	7.36	95.25	7791

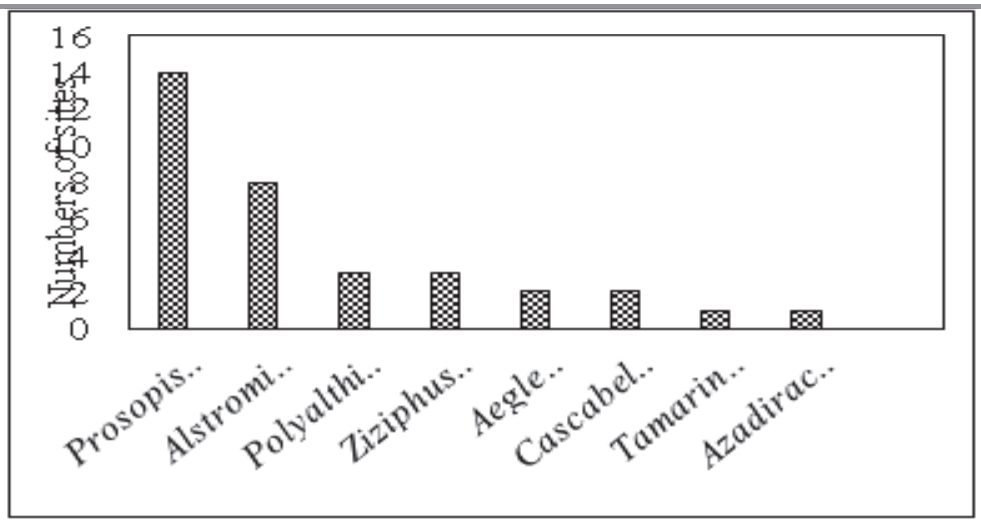


Figure 1.2 Number of roosting sites of each tree species.

0-100 population: Total three tree species were used viz. Golden apple (*Aegle marmelous*), Yellow oleander (*Cascasbela thevetia*) and Neem tree (*Azadirachta indica*) by lower population (0 -100). These sites were with trees having GBH from 30 to 143 cm, canopy width and canopy height were 22 m and 8 m respectively (Fig.1.5).

100-1000 population: Three tree species were used by population of 100 – 1000; these tree species had GBH from 89 to 115 cm. Canopy width was 12 to 26 meters while canopy height between 2 to 6 m. These trees were having tree height up to 8 m (Fig.1.6).

1000-2000 and >2000 population: Population of more than 2000 and 1000- 2000 (good population) were roosting on tree species of Mesquite tree (*Prosopis juliflora*) and Devil tree(*Alstromia scholaris*) respectively (Fig.1.7). These tree spices were having average GBH value from 90 to 135 cm, canopy height 5 to 8 m canopy width of 22 to 33 m and tree height 5 to 9 m (Fig.1.7).

Figure 1.4 Average tree measurements of four categories of population.

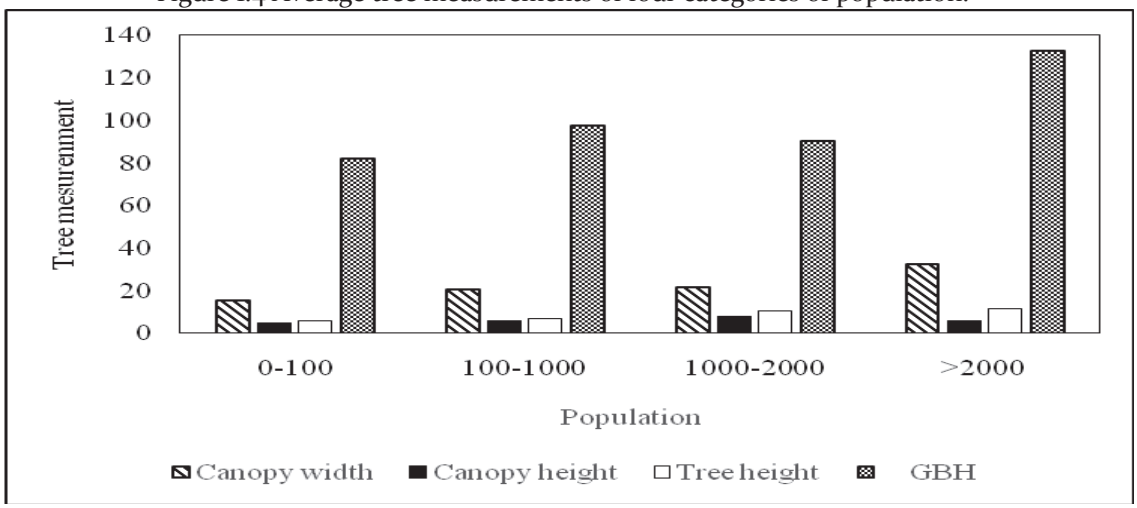
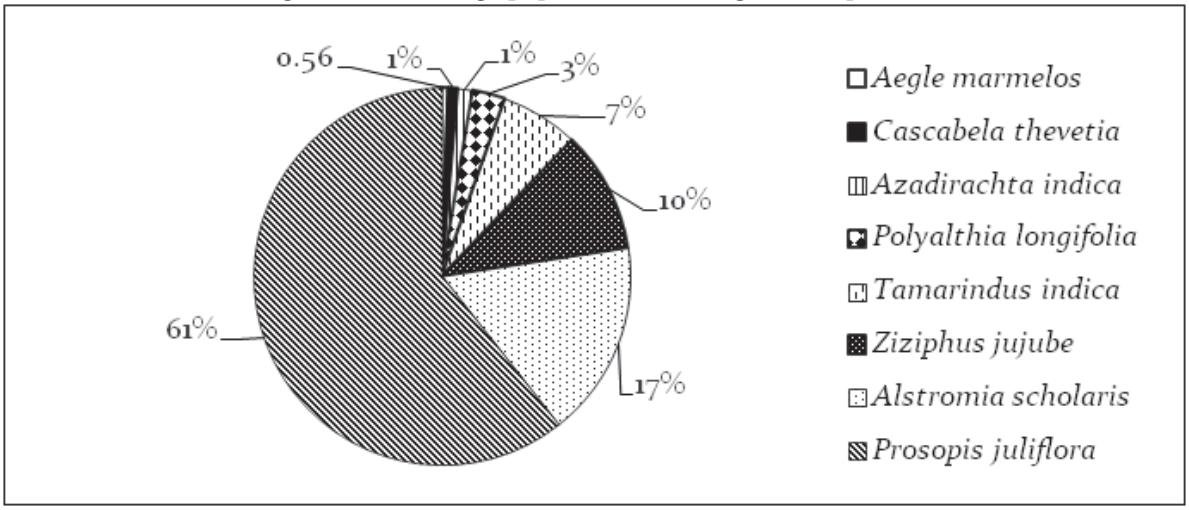


Figure 1.3 Percentage populations roosting at tree species.



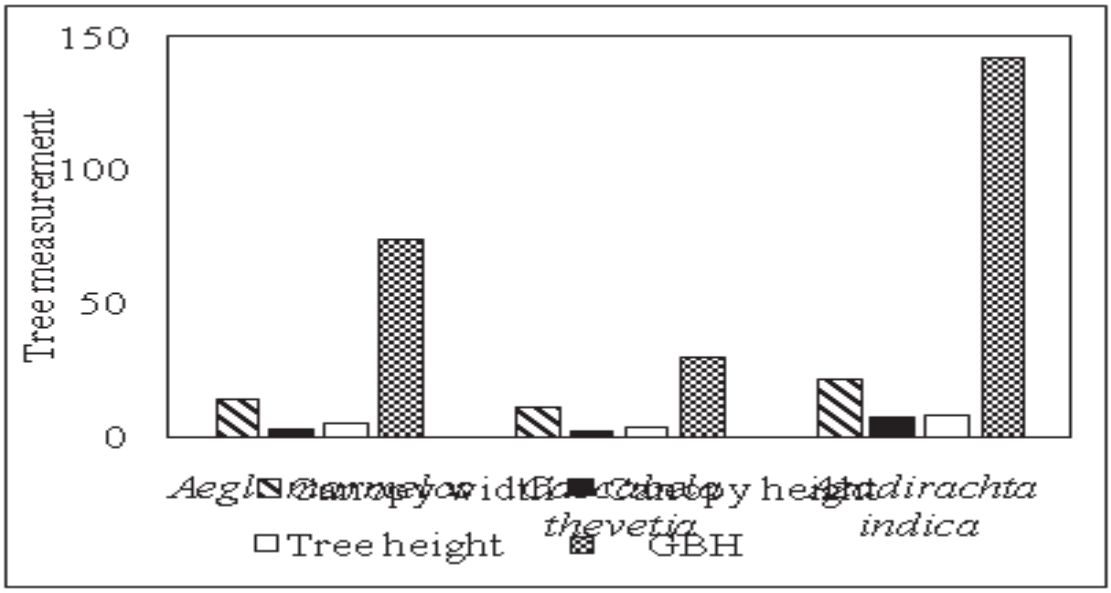


Figure 1.5 Tree measurements of population 0 to 100.

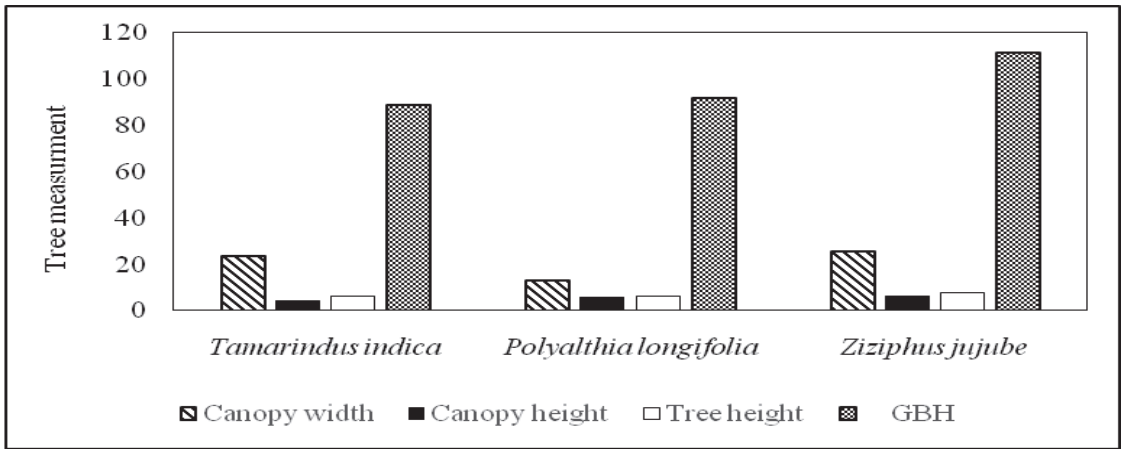
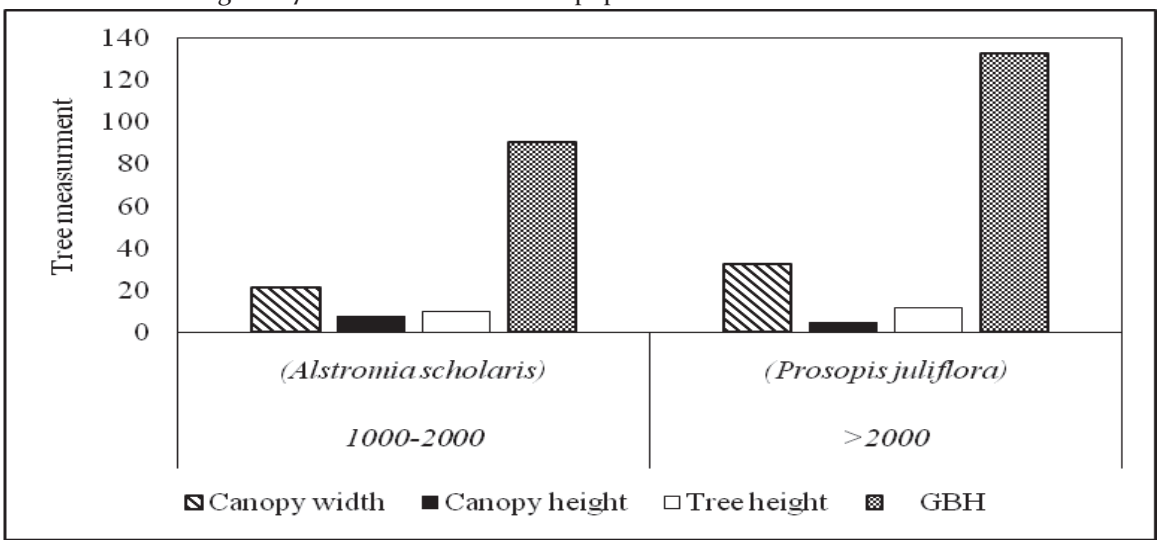


Figure 1.6 Tree measurements of population 100 to 1000

Figure 1.7 Tree measurements of population 1000-2000 and >2000



Discussion: The common trees used by house sparrow were Ashoka tree (*Polyalthia longifolia),* Jujube tree (*Ziziphus jujube*). Devil tree (*Alstromia scholaris*) and Mesquite tree (*Prosopis juliflora*). Among these, *Prosopis juliflora* was the dominant tree species (61% population). Sparrows were observed to roost on not much larger trees. Average tree measurements of such trees were i.e. tree height up to 8 meters, canopy cover 20 meters, canopy height 5 meters and GBH of 95 cm. Sparrows were observed to roost on trees having higher canopy height which was almost half of the total height of the tree. House sparrows preferred to roost on spiny trees such as Mesquite tree (*Prosopis juliflora*), Jujube tree (*Ziziphus jujube)* and Tamarind tree (*Tamarindus indica*). Therefore we accept our hypothesis that sparrows require spiny, evergreen and comparatively smaller trees for roosting.

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