Full Length Research Paper

Some demographic characteristics and their relationship with out door plant material: a case study from Malatya City, Turkey

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Consistent increase in world's human population and construction activities condensing especially in urban areas have recently caused people away from the nature. Green spaces in urban areas have thus gained importance turning out to be the sites where people meet their recreational needs in nature. Among the hotly debated topics during the development process of cities is the quality and quantity of open green spaces. House gardens are also an important part of green space identity. People grow the ornamental plant species in their private lands depends on ecological and socio-cultural characteristics of the area. Demographic characteristics are among the most important parameters in many studies. Taking these characteristics into consideration when choosing outdoor ornamental plant species may play important roles in the plantation practices of either individuals or local governments. Province of Malatya, chosen to be the study area, is one of the most important fruit growing areas of Turkey accounting alone for 11% of world's fresh apricot production and 70% of world's dried apricot production. Therefore, house gardens plays a significant role in increasing the green areas in urban localities. This study is based on the hypothesis whether demographic characteristics such as gender, education level, age, occupation and marital status etc. may have effects on the factors people consider when choosing outdoor ornamental plant species and the features of plant species. In order to testify the hypothesis, a semistructured interview was conducted and data were recorded for different parameters from 420 people in the city centre of Malatya. The statistical analysis showed that the demographic variables, gender and occupation are statistically effective characteristics when choosing outdoor plant species considering their features, while marital status, age and education level were not statistically effective.

Keywords: plant features, demographic characteristics, Malatya city, green space, house gardens

INTRODUCTION

All the plants used to expand the green cover in a garden are defined as outdoor plants mainly composed of trees; small trees; shrubs; creepers and climbers; annual, biannual and perennial grassy plants; bulbous, tuberous and rhizome plants with consistent roots; turf plants and hydrophytes (TRMNE, 2007). As stated by many previous studies, plants have multi-facet contributions to urban ecosystems. Urban trees have numerous benefits for urban ecosystems by achieving a series of useful things such as mitigating air pollution; balancing extreme temperatures and thus saving energy; adding moisture in urban atmosphere; preparing suitable habitats for fauna and flora (Beckett et al.,, 1998; 2000; Yılmaz and Irmak, 2004); reducing noise level (Walker, 1991; Akbari et al.,, 2001); relieving the impacts of wind, dust and greenhouse emissions (Çepel, 1988; Novak et al.,, 2000; Akbari, 2001), absorbing sunlight reflecting from surfaces (Heisler, 1986; Walker, 1991; Novak and Crane, 2002).

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Humans have used plants throughout their history to receive the ecosystem services in and out of their living areas (Bargali et al 2004, 2007). Presently in cities, plants are indispensable part of urban ecosystems. With the increase in human population the industrialisation have been increased and enhanced the stress and open non green spaces in urban areas (Yılmaz and Irmak, 2004). To get rid with these problems people in urban areas are using various plant species with different characteristics and functions in and outdoor areas. Impacts of climatic, edaphic and biological factors varying according to regional and geographical differences are not so important in indoor areas. However, such factors have greater impacts in outdoor areas like house gardens and city parks etc (Arora et al 2011).

Among the factors affecting people's choice for plant species in their private garden depends on the design and landscape of garden and also on individual demographic characteristics in a region. The objectives of the present study were to determine the effect of such demographic characteristics as gender, marital status, age, education and occupation on the features of plants in Malatya consider as criteria when they decide to use these plants in their house gardens.

MATERIAL AND METHOD

The study was conducted in Malatya city centre. Semistructured interviews (Bargali et al., 2009, Pandey et al., 2011) were conducted in the city centre of Malatya for which 420 people were selected from houses, streets, squares, parks, cafes, shopping malls and offices. Natural environmental conditions suitable for fruit production, annual statistical reports, inventory data and previous studies related to the topics were used as supportive documents.

Malatya city, named in the Hittites period as Melitue, Maldiya or Melita meaning orchard, has been in a rapid urbanisation process during the last years. It is a city where densely accumulated human population lives, new settlement and residential areas rapidly grow. From the early ages of history various civilisations have inhabited the province and its surrounding due to its location and being on a passage route between Anatolia and Mesopotamia (GDF, 2010).

Province of Malatya is located in a 12313 - km^2 area (35° 54'; 39° 03' N and 38° 45'; 39° 08' E) in Upper Euphrates Basin in East Anatolia Region and southwest end of subsidence area covering the provinces of Adıyaman, Malatya, Elazığ, Bingöl, Muş and Van. Malatya is surrounded by Elazığ, Diyarbakır and Adıyaman in the south, Kahramanmaraş in the west, Sivas and Erzincan in the north. The province of Malatya has access route to Mediterranean through Sultansuyu and Sürgü Creek Valleys, to Interior Anatolia through Tohma Valley, to East Anatolia through Euphrates Valley and the province serves a passage area between the regions (GDF, 2010).

Land form is generally rugged in the province and composed of plateaus and mountains. Mean sea level altitude is between 750 and 1000 m and city centre is located at an elevation of 960 m. While high west part of South-eastern Toros Mountain Ranges extends in the south of the province, great part of the land is convenient for agriculture and composed of turf and rangelands. Agriculture and rangeland area account for 34 and 47% of the province respectively (GDF, 2010).

Continental climatic characteristics are prevalent in the city. According to data obtained from the Meteorological Station at 950 m and 8 km out of city centre, long-term (1970-2011) mean temperature is 14°C; warmest month of the year is July (27.5°C); coldest month of the year is January (0°C); ever recorded maximum mean monthly temperature is 34.1°C (July); mean minimum temperature is -2.9°C (January); mean annual number of days with snow or rainfall is 93; the number of frosty days is 69; yearly rainfall is 372.7 mm. According to Thorntwaite method, Malatya is semiarid, less moist, considerably hot, where excessive water can be seen in winter (85 – mm water excesses in January, February, and March). Water deficiency for plants begins in April and peaks in July and August and lasts until October (GDF, 2010; TSMS, 2012).

Malatya accounts for 11% of world's fresh apricot and 70% of dried apricot production. From this point of view, the city deserves to be called "World's Apricot Capital". Apart from apricot, a great variety of fruits such as apple, grape, mulberry, almond, peach, walnut, pear, cherry, sour cherry, can grow in the province. Ratio of the area in Turkey where fruits can grow to total arable land 6.3% while this value is about 22% in Malatya, which is 3.5 fold more (EDA, 2010). Population of the city centre is 419959 according to (TÜİK) Turkish Statistics Institution (TSI, 2012).

Demographic characteristics of participants were accepted to be five factors as gender, marital status, age, education and occupation. Participants were asked to make their first choice from eight alternative outdoor plant features given below, which they use or think of using in their gardens.

- Aesthetics (beauty of flower, leaf, stem; plant form, colour, tissue, harmony etc.)
- Maintenance of plants
- Being evergreen
- Fruit giving
- Quick growth
- Tolerance to poor climate and soil conditions
- Resistance to diseases
- Others

Statistical analysis of data obtained from questionnaire forms was performed using Chi- Square Test in SPSS 17.0 software.

Table 1. Demographic variables and their distribution for categories

Variable	Group	Number	Ratio (%)
Gender	Male	217	51.7
	Female	203	48.3
Marital status	Married	257	61.2
	Single	163	38.8
Age	I (20 and under)	38	9.2
	II (21 to 40)	232	55.2
	III (41 to 60)	124	29.5
	IV (61 and above)	26	6.2
Occupation	Officer	76	18.1
	Worker	51	12.1
	Retired	35	8.3
	Self employed	63	15.0
	Unemployed	21	5.0
	Farmer	7	1.7
	Other	167	39.8
Education	Illiterate	24	5.7
	Primary school	69	16.4
	Secondary school	52	12.4
	High school	147	35.0
	Two – year degree	37	8.8
	University graduate	83	19.8
	Graduate	8	1.9

RESULTS

Demographic characteristics of the participants (gender, marital status, age, education and occupation) and the features of outdoor plants the participants found to be important and the results of statistical analysis are presented in the parts divided for each demographic characteristic (Table 1).

Gender

It was found from the statistical analysis that 51.7% of participants are male and rest is female. When preference of outdoor plant features is considered for gender, it was observed that 35.5, 24.9, 14.3, 9.7, 9.2, 4.6, 1.4 and 0.4% of males choose fruit giving, aesthetics, evergreen ness, easiness to maintain the plant, quick growth, resistance to diseases, tolerance to poor climate and soil conditions and others, respectively. Some of the participants also preferred the exotic species for their gardens.
Female participants preferred aesthetics, fruit giving, being evergreen, easiness to grow the plants and their maintenance, quick growth, tolerance to poor climate and soil conditions and resistance to diseases by 36.5, 26.6, 11.8, 10.3, 6.9, 4.9, and 3%.
According to Chi – square test showed significant difference between male and female participants for plants features accepted having 95% ($p<0.05$) confidence interval (Table 2).

Marital status

When marital status of participants is considered, it seems that 61.2% are married and the rest are un-married. For plant features participants prefer, 33.5, 25.7, 15.2, 9.7, 9.3, 3.5, 2.7 and 0.4% of the married participants select fruit giving, aesthetics, being evergreen, easiness to plant and maintain, quick growth, resistance to diseases, tolerance to poor climate and soil conditions and others, respectively.
Single group preferred aesthetics, fruit giving, easiness to plant and maintain, being evergreen, quick growth, resistance to diseases and tolerance to poor climate and soil conditions by 38, 27.6, 10.4, 9.8, 6.1, 4.3 and 3.7%, respectively.
There is no statistically significant difference between marital status of participants according to Chi-square test for outdoor plant features they prefer ($p>0.05$) (Table 2).

Age

Participants were categorized into four groups (20 years ≥, 21 to 40 years, 41 to 60 years, 61 years ≤) for their ages and these groups were evaluated for their plant

Table 2. Test results of variables

Variable		Value	Df	Asymp. Sig. (2-sided)
Gender	Pearson Chi-Square	14.431	7	0.044*
	Likelihood Ratio	15.061	7	0.035
	Linear-by-Linear Association	4.573	1	0.032
Marital status	Pearson Chi-Square	10.688	7	0.153 NS
	Likelihood Ratio	11.065	7	0.136
	Linear-by-Linear Association	3.866	1	0.049
Age	Pearson Chi-Square	30.320	21	0.086 NS
	Likelihood Ratio	31.210	21	0.070
	Linear-by-Linear Association	5.997	1	0.014
Occupation	Pearson Chi-Square	63.713	42	0.017*
	Likelihood Ratio	65.904	42	0.011
	Linear-by-Linear Association	0.059	1	0.808
Education	Pearson Chi-Square	50.309	42	0.178 NS
	Likelihood Ratio	51.835	42	0.142
	Linear-by-Linear Association	15.327	1	0.000

feature preference. Nine percent of participants were below 20 years, 55.2% were 21 to 40 years, 29.5% were 41 to 60 years, 6.2% were 61 years and above. Mean age of participants is 36.1 years ranging from 15 to 88 years.

Group I (20 years ≥) preferred fruit giving (36.8%), aesthetics (28.9%), being evergreen (7.9%), quick growth (7.9%), tolerance to poor climate and soil conditions (7.9%), easiness to plant and maintenance (5.3%), resistance to diseases (5.3%). Group II (21 to 40 years) preferred aesthetics (36.6%), fruit giving (24.6%), being evergreen (15.1%), easiness to plant and maintenance (11.6%), quick growth (7.3%), resistance to diseases (2.6%), tolerance to poor climate and soil conditions (2.2%). Group III (41 to 60 years) preferred fruit producing, aesthetics, being evergreen, rapid growth, %), easiness to plant and maintain, resistance to diseases, tolerance to poor climate and soil conditions and others in the rates of 37.9, 23.4, 10.5, 8.9, 8.9, 5.6, 4.0 and 0.8% respectively. Group IV (61 years ≤) preferred fruit producing, (50.0%), being ever green (15.4%), aesthetics (11.5%), quick growth (11.5%), easiness to plant and maintain (7.7%) and resistance to diseases (3.8%).

No statistically significant differences were found between age groups for their preference of outdoor plant features ($p > 0.05$) (Table 2).

Occupation

Participants were categorized into seven groups for their

occupations; officer (18.1%), worker (12.1%), retired (8.3%), self employed (15%), unemployed (5%), farmer (1.7%), other (students and housewife; 39.8%). When participants were considered for their occupations, officer group preferred aesthetics, fruit giving, easiness to plant and maintenance, being evergreen, quick growth, tolerance to poor climate and soil conditions and resistance to diseases in the rate of 43.4, 22.4, 10.5, 8.2, 6.6, 5.3 and 2.6%, respectively. Participants in worker group selected the features of fruit giving, aesthetics, being evergreen, easiness to plant and maintenance, resistance to diseases, quick growth and tolerance to poor climate and soil conditions in the rates of 37.3, 23.5, 15.7, 11.8, 5.9, 3.9 and 2%, respectively. Retired group preferred fruit plants (62.9%), aesthetics (14.3%), quick growth (11.4%), resistance to diseases (5.7%), being evergreen (2.9%) and easiness to plant and maintain (2.9%). Self employed group preferred fruit giving (34.9%), aesthetics (25.4%), being evergreen (19%), quick growth (11.1%), easiness to plant and maintain (7.9%) and other (1.6%; exoticness). Unemployed group preferred aesthetics, fruit giving, tolerance to poor climate and soil conditions, being evergreen, resistance to diseases, easiness to plant and maintain and quick growth in the rate of 42.9, 19.0, 9.5, 9.5, 9.5 4.8 and 4.8%. Farmer group preferred fruit giving (42.9%), easiness to plant and maintain (28.6%), aesthetics (14.3%) and resistance to diseases (14.3%). Participants in "others" group preferred aesthetics, fruit giving, being evergreen, easiness to plant and maintain, quick growth, resistance to diseases tolerance to poor climate and soil

conditions in the rate of 31.1, 26.3, 15.0, 11.4, 9.0, 3.6, and 3.6%, respectively.

Differences in the preference of features by occupation groups were found to be statistically significant at 95% ($p < 0.05$) confidence interval (Table 2).

Education

Distribution of participants for educational levels is that 5.7% is illiterate, 16.4% is primary school graduate, 12.4% is secondary school graduate, 35% is high school graduate, 8.8% has two-year degree, 19.8% university graduate and 1.9% has graduate degree.

Illiterate group's preference is fruit giving, aesthetics, being evergreen, easiness to plant and maintain and quick growth with the percentages of 50.0, 20.8, 16.7, 8.3, and 4.2%, respectively. Primary school graduate group preferred fruit giving, aesthetics, being evergreen, quick growth, easiness to plant and maintain, resistance to diseases, tolerance to poor climate and soil conditions and others (exoticness) with the percentages of 44.9, 15.9, 13.0, 10.1, 7.2, 4.3, 2.9 and 1.4%, respectively. Secondary school graduate group preferred fruit giving, aesthetics, easiness to plant and maintain, quick growth, being evergreen, resistance to diseases and tolerance to poor climate and soil conditions in the rates of 30.8, 19.2, 19.2, 13.5, 9.6 and 3.8%, respectively. Participants in high-school graduate group preferred aesthetics, fruit giving, being evergreen, easiness to plant and maintain, quick growth, resistance to diseases and tolerance to poor climate and soil conditions 30.6, 28.6, 15.6, 8.8, 8.2, 4.8 and 3.4%, respectively. Participants having two-year degree preferred aesthetics, fruit giving, being evergreen, easiness to plant and maintain, quick growth, resistance to diseases and tolerance to poor climate and soil conditions with the percentages of 43.2, 27.0, 13.5, 5.4, 5.4, 2.7 and 2.7%, respectively. University graduate participants preferred aesthetics, fruit giving, easiness to plant and maintain, being evergreen, quick growth, resistance to diseases and tolerance to poor climate and soil conditions in the rates of 42.2, 24.1, 10.8, 9.6, 6.0, 3.6, 3.6%, respectively. Participants having graduate degree preferred aesthetics, easiness to plant and maintain and being evergreen in the rates of 75.0, 12.5 and 12.5%, respectively.

There is no statistically significant difference in the preference of participants between educational levels ($p > 0.05$) (Table 2).

DISCUSSION AND CONCLUSION

Consistently increasing human population causes cities to enlarge. Two concepts having linear correlation determining role in the distance between urban people and nature. Spatial enlargement of cities increases the distance and time to reach nature by people by decreasing the visit frequency. Structural density is an element which can take people under psychological stress. Measurable increase observed in two elements also increases people's need for nature, recreation and green on one hand while on the other hand, they make difficult to meet these needs. In this respect, city parks and private house gardens have very important roles in meeting these needs. Especially house gardens are important elements for accessibility and showing owner's decision making on their garden design.

Preference of plant species in landscape practices may vary from country to country and region to region depending on socioeconomic structure and ecological conditions (Kuş and Erhan, 2009). Several previous studies dealt with the factors and plant features affecting plant preference. Yılmaz and Zengin (2003) and Yılmaz (2006) determined the plant features people prefer in Erzurum and Tekirdağ cities, respectively, through questionnaire.

In the present study, 31.2% of participants prefer fruit producing plants they use in their gardens while Yılmaz (2006) and Yılmaz and Zengin (2003) both found that aesthetics is the element preferred by people in Erzurum and Tekirdağ cities. In the present study preference was given to grow the fruit plants as compared to other two cities because people in Malatya have a background full of fruit growing.

When the results are evaluated for gender, 35.5% of male participants prefer fruit giving plants while females prefer aesthetics. Statistical analysis revealed that gender is a distinctive factor for preferred plant features in Malatya.

Married participant prefer fruit giving property of plants in the rate of 33.5% while the choice of 38% of single ones is aesthetical feature of the plant even though no statistically significant difference was seen according to marital status.

For age groups, only Group II found aesthetics to be the most important plant feature while Group I, III and IV preferred mostly the fruit giving though the statistical difference between age groups is not significant.

For occupation groups," officers", "unemployed" and "others" preferred aesthetics mostly while retired, self employed and farmer group preferred mostly fruit giving feature of plant. Difference in the preference of plant features between occupation groups is statistically significant.

When education levels are considered, illiterate, primary and secondary school graduate groups preferred firstly fruit plants while those receiving high school, vocational school, undergraduate or graduate education choose aesthetics the most. Difference in the preference of education groups was found not to be statistically significant.

Consequently, among five demographic variables investigated in the sample of people in Malatya, only

gender and occupation have effect on the preference of plant features used in outdoor areas while marital status, age and education were not found to be effective elements on the preference of plant features.

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