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The Investigation of Ornamental Plant Species Present in Pattoki Nurseries the Major Floral Business Hub of Pakistan

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Abstract: The present study was conducted to collect the exotic and indigenous plants species data from the 210 Nurseries of Pattoki in three months. Present findings confined to 147 plant species which belong to 52 families. It includes 61 species of trees, 46 species of shrubs, 11 species of palms, 8 species of grasses and 15 species of indoor plants. All these plant species have important use in landscaping. It includes plant species ranging from tropical environment to subtropical and temperate zone. The main aim of this study was to highlight the flora of Pattoki nurseries and plant species which are currently being used for landscaping in Pakistan. List of these plants, their environmental requirements and habit of growth is presented.

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Keywords: Ornamental Plants, Pattoki, Indigenous Plants, Nursery

Introduction

Pattoki is the city in District Kasur of Punjab province in Pakistan. It is headquarter of Pattoki Tehsil and the 2nd biggest city of District Kasur by Population. The city is known as "The City of Flowers". It is named after a caste of Hindus called Pattwaan. It was a Hindu-Sikh dominated town famous for its cotton production and was called The "Cotton Queen". After the independence of Pakistan the cotton industry became weak. This city is still a big trade center for a number of villages attached to its surrounding areas. The Changa Manga forest is 10 kilometers and Ghehlan's nurseries are 1 kilometer away from this city. Its green market is famous all over the Punjab for production and distribution. Pattoki was declared as "Queen of Flowers" by Queen Elizabeth because of the largest flower market in this region. Farmers export their flowers and flower products to all over the world. It is further comprises of 72 villages. The main usages of plants include: sources of food, vegetables, fruits, beverages, drinks, spices, condiments (Schultes, 1992).

Pattoki is the Hub of the nursery farms in the Asian Subcontinent. There are about 850 small scale and large scale nursery farms present. It comprises of about 5 km belt of nurseries on the Multan road. The number of these nurseries is 186 which are on the front side of road. These nurseries have plants species ranging from temperate zone plants to the subtropical and tropical zone plants which is the natural ability of the Pattoki environment. These plants include tree species, shrubs, palms, creepers, grasses, bonsai, topiaries and other indoor plants. By installing a garden in your property you are effecting environment in a positive way (Domm, 2012). Type of soil and PH value of the soil affects the planting during landscaping (Art, 2007), (Burrell:, 2007). Pattoki soil is the sandy loam soil which is very suitable for planting (Jalali and Jalali, 2016).

Pattoki contains one of the biggest setup of the nursery farms. Nurseries business was started here since 18th century. Now the setup has become so vast that plants are exported to other cities as well as to the other countries Like Dubai and Saudi Arabia. Plants are also imported from china, Malaysia, Holland, USA and from some European countries (Zafar, 2007). These are the exotic plant species and have a great demand in Pakistan. One of the biggest problem of production is lack of knowledge among farmers about latest agriculture technology and also farmers are deprived of efficient government support (Perera, 2007), (Abid et al., 2016), (Hussain et al., 2015). Some of the problems have restricted the nursery business only within Pakistan.

Plants present in Pattoki are used for landscaping in Parks, Lawns, gardens and road side plantations. Local plants are used for various other purposes, such as agricultural implements, roof thatching, mats and baskets, religious purposes, etc. As a consequence, the natural tropical thorn forest of Punjab comprising *Prosopis cineraria* (Linn.) Druce, *Tamarix aphylla* (Linn.) Karst, *Salvadora oleoides* Decne and *Capparis decidua* (Forssk.) Edgew, is disappearing at alarming rate (KHAN, 2012). These are

used for the purpose of shade, hedges and for different functions like elimination of soil erosion and indoor plants. Plants are primary producers, forming the base of food webs and support almost all other forms of life (Rockwell et al., 2014). Information, foresight and practices of local people can play their role through applied ethnobotany to identify and find solutions to the problems of sustainable development and conservation of plants (Hamilton, 2003).

Material and Method

The data about the plant species was collected by regular visit to the nurseries in the Pattoki. 210 nurseries were visited and plant species were identified and there medicinal value was estimated with the help of Flora of Pakistan (A. Razaq, 2010). Export and import potential of nurseries was documented by individual interviews of nursery owners. A semi-structured questioner was used to record data on the spot. Prices of plants were noted down from all nurseries for a specific plant by conducting a brief interview of nursery owners and an average was calculated to get a round figure. It was observed that the price of plant depends on the size of pot, age of plant, type of plant, investment required for the cultivation of plant and its growth habit.

Results and Discussion

The data collected was arranged on the bases of category of plant species (trees, Shrubs, Ornamental, palms, Flowers, Indoors, grasses, creepers and climbers), family and its environmental adaption (tropical, Subtropical and temperate). It include above 100 species of plants which are used in the landscape. The common names, botanical names, family and adopted climate of all the plants species that were identified during the survey are shown (Table. 1). The plants which were identified and the family to which they belong are presented (Figure 1 and Figure). It was observed that plant belonging to Euphorbiaceae, Palmae, Moraceae and Apocynaceae show significant value with the highest number from Leguminosae family. It also includes all the exotic plants (Small in Number) which are imported majorly from China and Thailand and are kept under shade or green house conditions. Almost all the nursery owners were illiterate and therefore only conventional ways of plant production were adopted. But there were also those farmers which were using latest technology despite the fact that they were uneducated.

Table 1: Plant Species available in Nursery Market of Pattoki

Common Name	Botanical Name	Family	Adopted Climate
Shrubs			
Aclypha	*Aclypha wilkesisan*	Euphorbiaceae	Tropical And Subtropical
Desert Rose	*Adenium besum*	Apocynaceae	Tropical And Subtropical
Salt Bush	*Atriplex crassifolia*	Chenopodiaceous	Subtropical And Tropical
Dwarf Fern Leaf Bamboo	*Bambusa nana*	Gramineae	Subtropical And Tropical
Phillippine Violet	*Barleriav cristata*	Acanthaceae	Tropical
Summer Lilly	*Buddleia hybrida*	Leguminosae	Subtropical
Poinciana	*Poinciana pulcherriama*	Leguminosae	Subtropical
Aabel	*Calligonum cosmosum*	Polygonaceae	Tropical And Subtropical
Natal Plum	*Carissia grandiflora*	Apocynaceae	Subtropical
Cassia	*Cassia gulaca*	Leguminosae	Tropical And Subtropical
King Of The Day	*Cestrum diarrnum*	Solanaceae	Tropical And Subtropical
Queen Of Night	*Cestrum nocturnum*	Solanaceae	Tropical And Subtropical
Sour Orange	*Citrus aurantium*	Rutaceae	Subtropical
Naranji	*Citrus mitis*	Rutaceae	Subtropical
Hopseedbush	*Dodonea viscose*	Sapindaceae	Subtropical
Dracaena	*Dracaena marginita*	Liliaceae	Subtropical

Duranta	*Duranta repans*	Verbenaceae	Subtropical
Poinsettia	*Euphorbia pulcherrina*	Euphorbiaceae	Subtropical
Cape Jasmine	*Gardenia florida*	Rubiaceae	Tropical
Lignum Vitae	*Guaiacum sanctum*	Zygophyllaceae	Tropical
Fire Bush	*Hamelia patens*	Rubiaceae	Subtropical
Cotton Rose	*Hibiscus mutabilis*	Malvaceae	Subtropical
Morpankh	*Thuja orientials*	Cupressaceae	Subtropical,Tropical And Temperate
Yellow Oleander	*Thevetia peruviana*	Apocynaceae	Subtropical
Yellow Bells	*Tecoma cedar*	Bignoniaceae	Subtropical
Tamari	*Tamarix nilotica*	Tamariaceae	Subtropical,Tropical And Temperate
Chine Rose	*Hibiscus sinenses*	Malvaceae	Tropical And Subtropical
Ixora	*Ixora coccinea*	Rubiaceae	
Spanish Jasmine	*Jasminum grandiflorum*	Oleaceae	Subtropical
Motia	*Jasminum sambac*	Oleaceae	Subtropical And Tropical
Jatropha	*Jatropha gossypifolia*	Euphorbiaceae	Tropical And Subtropical
Kapata	*Kadiya calycina*	Malvaceae	Subtropical
Gul E Fanoos	*Lagestromia indica*	Lythraceae	Subtropical
Lantana	*Lanatan camara*	Verbenaceae	Tropical And Subtropical
Henna	*Lawsonia alba*	Lythraceae	Subtropica
Turkish Hibiscus	*Malaviscus arboreus*	Malvaceae	Tropical
Murwa	*Murayya exotica*	Rutaceae	Tropical Subtropical
Myrtus	*Myrtus communis*	Myrtacaeae	Subtropical
Kaner	*Nerium odorum*	Apocynaceae	Subtropical
Night Flowering Jasmine	*Nyutanthus arbortristis*	Oleaceae	Subtropical
Mock Orange	*Pittosporum tobira*	Pittosporaceae	Subtropical
FrangiPani	*Pulmeria rubra*	Apocynaceae	Subtropical
Peach	*Prunus persica*	Rosaceae	
Anar	*Punica granatum*	Punicaceae	Subtropical
Rose	*Rosa hybrids*	Rosaceae	Subtropical
Jojoba	*Simmondsia chinensis*	Buxaceae	Subtropical
Crape Jasmine	*Tabernaemontana divaricata*	Apocynaceae	Subtropical And Tropical
Palms			
Bottle Palm	*Areca catechu*		Tropical
Todbdy Palm	*Borassus flabellifera*	Palmae	Subtropical And Tropical
Coconut Palm	*Cocos nucifera*	Palmae	Tropical
Sago Palm	*Cycas revolute*	Cycadaceae	Subtropical
Chienes Fan Palm	*Livistone chinensis*	Palmae	Subtropical
Common Ornamental Palm	*Washingtonia robusta*	Palmae	Subtropical
Desert Fan Palm	*Washingtonia filifera*	Palmae	Tropical
Royal Palm	*Roystonea regia*	Palmae	Tropical
Date Palm	*Phoenix dactylifera*	Palmae	Tropical And Subtropical
Canary Palm	*Phonix canariansis*	Palmae	Subtropical

Bottle Palm	*Mascarena regaughanii*	Palmae	Tropical
Trees			
Beri	*Zizypus jajuba*	Rhamnaceae	Tropical and subtropical
Indian Almond	*Terminalea catappa*	Combretaceae	Tropical
farash	*Tamarix aphylla*	Tamaricaceae	Tropical and subtropical
Arjun	*Terminalea arjuna*	Combretaceae	Subtropical
Ashok tree	*Saraca indica*	Leguminosae	Tropical
makhanCharbi	*Sapium sebiferum*	Euphorbiacea	subtropical
weeping willow	*Salix babylonica*	Salicaceae	tropical and subtropical
Jiaputra	*Putranjiva roxburgii*	Euphorbiacea	Subtropical
Kanakchampa	*Pterospermum acerifolium*	Sterculiaceae	Tropical and subtropical
Babool	*Prosopis juliflora*	Leguminosae	tropical and subtropical
popular	*Populus nigra*	Salicaceae	tropical and subtropical
Lombardy tree	*Populous ecramericana*	Salicaceae	Subtropical
SukhChayn	*Pongamia galabra*	Leguminoseae	Subtropical
Rain tree	*Pithecellobium saman*	Leguminoseae	tropical
madras thorn (louse Handi)	*Pithecellobium dulce*	Leguminosae	Subtropical
Pistachio	*Pistacia integerrima*	Anacardiaceae	subtropical
cheel(Emodi Pine)	*Pinus roxburgii*	Coniferacea	subtropical
Alepo pine	*Pinus halipensis*	Pinaceaea	subtropical and temperate
Pakinsonia	*Parkinson aculetata*	Leguminosae	tropical and subtropical
Maulsary	*Mimusops elengi*	Sapotaceae	Tropical
Indian Cork tree	*Millingtonia hortensis*	Bignoniaceae	Tropical
bakain	*Melia azedarach*	Meliaceae	Subtropical
Mango	*Mangifera indica*	Anacardiaceae	tropical and subtropical
Flowering Crab Apple	*Malus bacatta*	Rosaceae	temperate
kikar	*Acacia arabica*	Leguminosae	Subtropical
Kikar	*Acacia farnesiana*	Leguminosae	Subtropical
Phulai	*Acacia modesta*	Leguminosae	Subtropical
Maple	*Acer ablongum*	Aceraceae	tropical and subtropical
Bel	*Aegel marmelo*	Rutaceae	tropical and subtropical
Tree of heaven	*Ailanthus glandulosa*	Simaroubaceae	tropical and subtropical
Plum albizia	*Albizia julibrissin*	Leguminosae	tropical and subtropical
Siris tree	*Albizia lebbeck*	Leguminosae	tropical and subtropical
Devil tree	*Alostonia scholaris*	Apocynaceae	tropical and subtropical
Auracaria	*Auracaria excelsa*	Coniferacea	tropical subtropical and temperate
Neem	*Azadirachta indica*	Meliaceae	Subtropical
kachnar	*Buhinia variegata*	Leguminoseae	
Toog tree	*Bischofia javanica*	Euphorbiaceae	tropical and subtropical
paper Mulberry	*Broussonetia papyrifera*	Moraceae	Tropical
Dhak	*Butea frondosa*	Leguminosae	Tropical
Bottle brush	*Callistemon lanceolatus*	Myrtacaeae	subtropica
Amaltas	*Cassia fistula*	Leguminosae	Tropical
November shower	*Cassia multijuga*	Leguminosae	Tropical and subtropical
desert saroo	*Casurina equisetifolia*	Casurinaceae	Tropical and subtropical
Tun	*Cedrela toona*	Meliaceae	Tropical and subtropical
Shisham	*Dalbergia saisoo*	Leguminosae	Subtropical
Gold mohar	*Delonix regia*	Leguminosae	Tropical and subtropical
Coral tree	*Erythrina suberosa*	Leguminosae	Tropical

Red Gum	*Eucalyptus camaldulensis*	Myrtacaeae	Subtropical and temperate
Safaida	*Eucalyptus citriodora*	Myrtacaeae	Tropical and subtropical
Jaman	*Eugenia jambulana*	Myrtacaeae	Subtropical
Council tree	*Ficus altissima*	Moraceae	Tropical
brgad tree	*Ficus bangalensis*	Moraceae	Tropical
weeping fig	*Ficus benjamina*	Moraceae	Tropical
Rubber plant	*Ficus elastic*	Moraceae	Tropical and subtropical
Pilkhin	*Ficus infectoria*	Moraceae	subtropical
Indian laurel plant	*Ficus nitida*	Moraceae	Tropical and subtropical
peepal	*Ficus religiosa*	Moraceae	Subtropical
Silver Oak	*Grevillea robusta*	Proteaceae	Subtropical
BeriPatta	*Hetrophragma adenophyllum*	Bignoniaceae	Tropical and subtropical
Neelum	*Jacaranda mimosifolia*	Bignoniaceae	Tropical and subtropical
Walnut tree	*Juglans regia*	Juglandaceae	subtropical
Sausage tree	*Kigelia pinnata*	Bignoniaceae	Tropical
lagestromia tree	*Lagestromia flosreginae*	Lythraceae	Tropical
White wax tree	*Ligustrum lucidum*	Oleaceae	Subtropical, Tropical and temperate
Climbers			
Clock vine	*Thunbergia grandiflora*	Acanthaceae	Tropical
Tecoma Climber	*Tecoma grandiflora*	Bignoniaceae	Subtropical
Rose creeper	*Rosa marehallniel*	Rosaceae	Subtropical and temperate
Rangoon creeper	*Quisqualis indica*	Combretaceae	Subtropical
Money plant	*Pothos scandens*	Aceraceae	Tropical
Passion fruit	*Passiflora edulis*	Passifloraceae	Tropical and temperate
Snow vine	*Porana paniculata*	Convovulaceae	Tropical
Golden trumpet	*Allamanda cathartica*	Apocynaceae	Tropical
Coral vines	*Antigonon leptopus*	Polygonaceae	Tropical
Calico Flower	*Aristolochia elegans*	Aristolochiaceae	tropical
Asparagus	*Asparagus myrtifolius*	Liliaceae	Subtropical
trumpet flower	*Bignonia venusta*	Bignoniaceae	Tropical, subtropical and temperate
Bogainvillea	*Bougainvillea alba*	Nyctaginaceae	Tropical
Gardeneia	*Clerodendron inerme*	Verbenaceae	Tropical and Subtropical
Creeping fig	*Ficus pumila*	Moraceae	Subtropical
Grasses			
vinca	*Vince minore*	Apocynaceae	Tropical and subtropical
verbena	*Verbena tenera*	Verbenaceae	Tropical
Wandering jew	*Tradescantia fluminensis*	Commelinaceae	Tropical
russelia	*Russelia juncea*	Scrophulariaceae	Subtropical
Rose moss	*Portulaca grandiflora*	Portulaceae	Subtropical
Niaz boo	*Ocimum basilicum*	Labiatae	Subtropical
Ice plant	*Mesembryanthemum crystallinum*	Aizoaceae	Subtropical
Bermuda grass	*Cynodon dactylon*	Gramineae	Tropical and subtropical

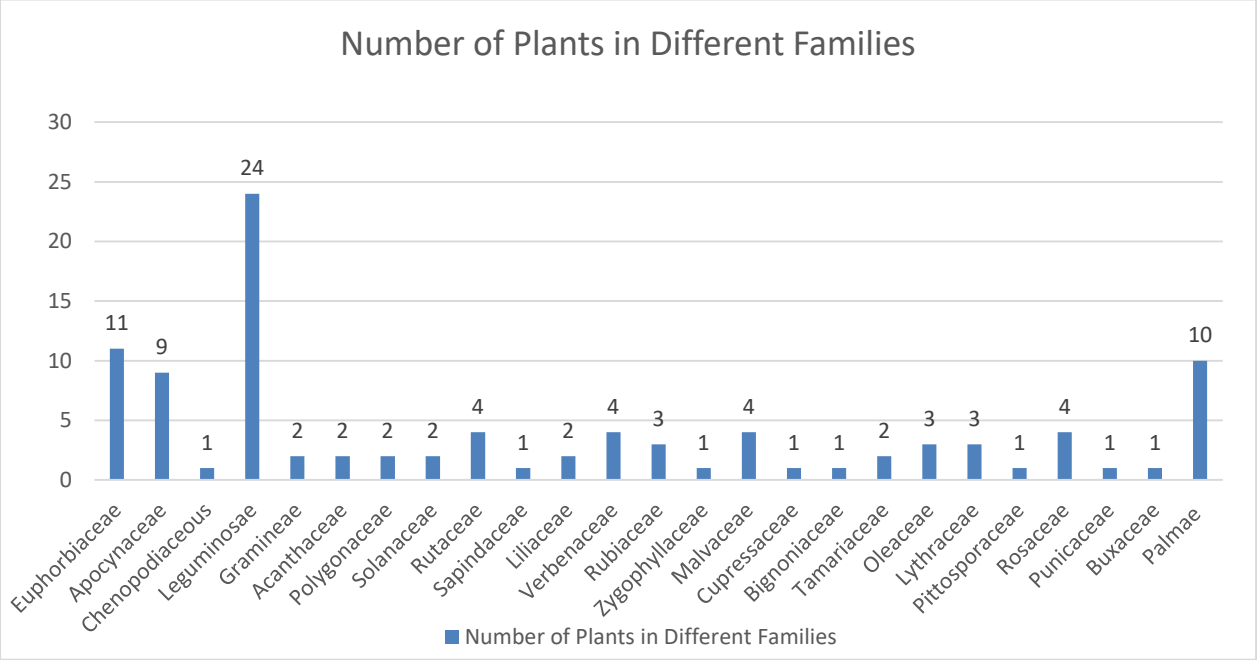

Fig 1. Number of Plants Identified for Each Family

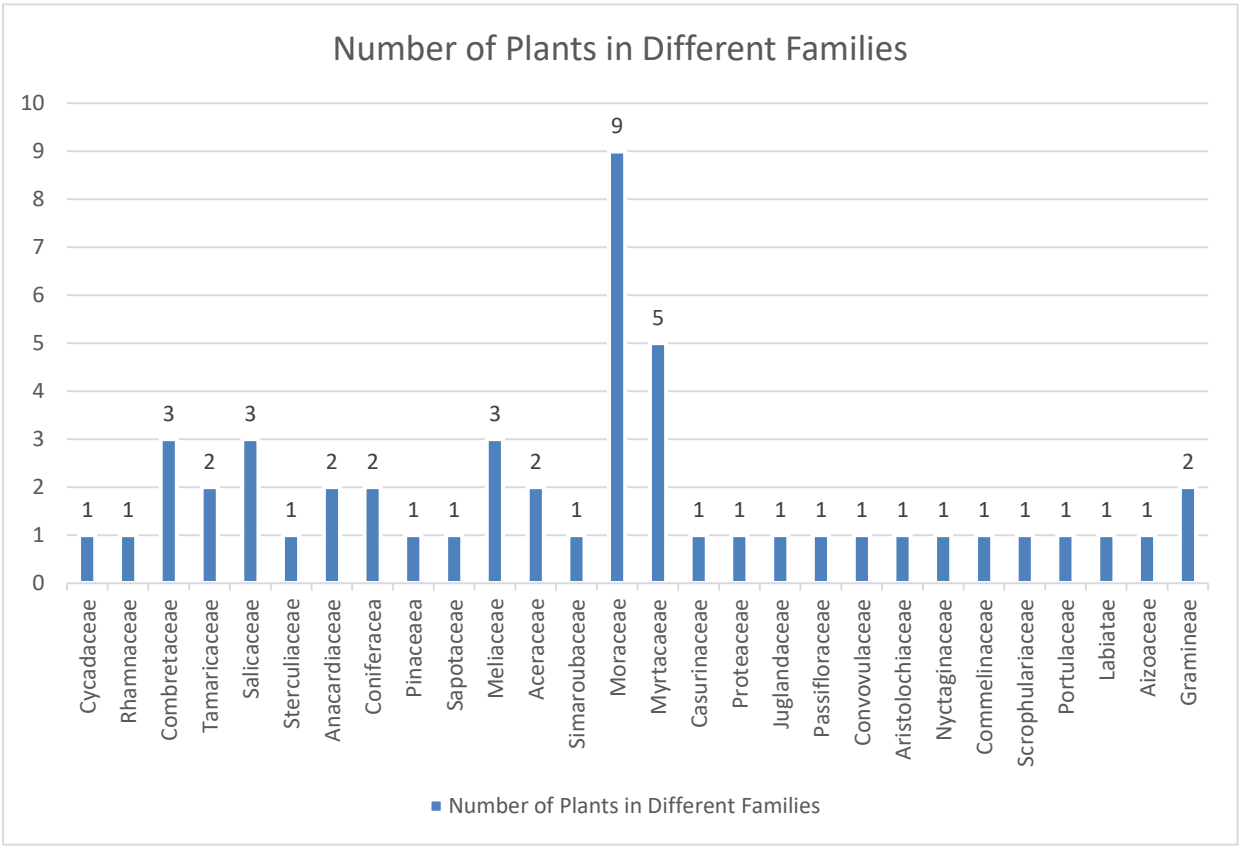

Figure 2. Number of Plants Identified for Each Family

Plants Species in Pattoki include plants of tropical, subtropical and temperate zone. These plants are widely used in the landscape structures of Pakistan. It includes 147 plant species from 52 families. These include trees, shrubs, palms, grasses and climbers. Most of the plants which are present in this region belongs to tropical and subtropical environment. During our survey 32 plants were identified which belongs to the tropical environment, 58 plants belong to the subtropical environment, 42 plants can face both tropical and subtropical environment, 4 can face tropical and temperate and 5 can withstand every kind of environment including tropical, subtropical and temperate conditions (Figure 3).

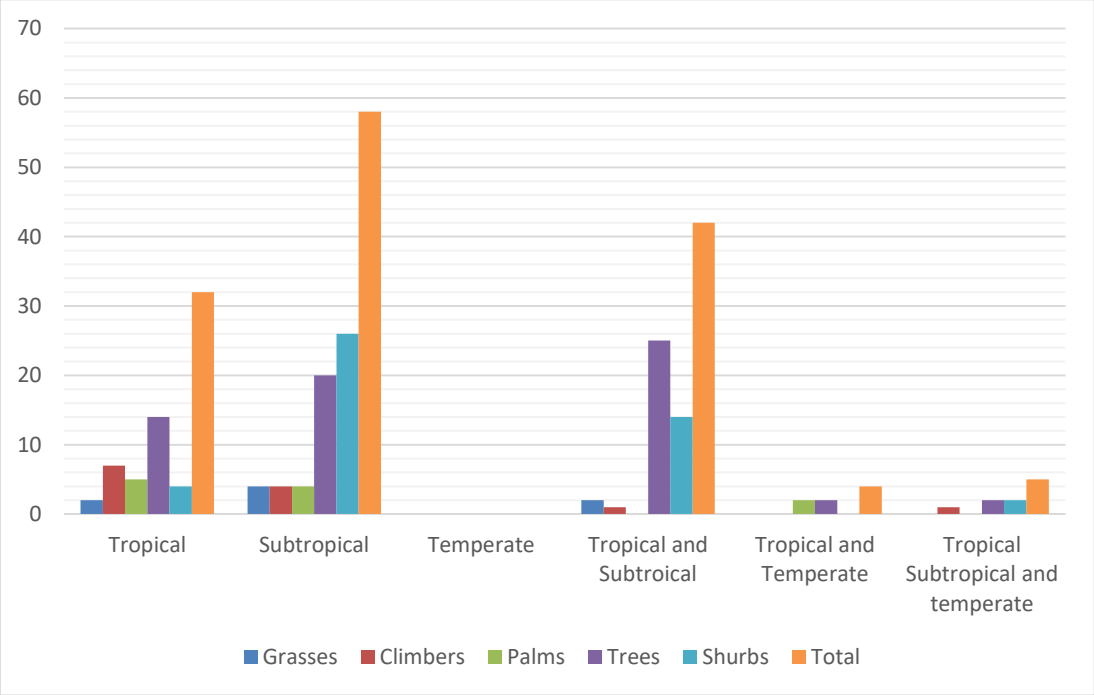

Figure 3. Environmental Distribution of Plants in Pattoki

It was observed that are two kinds of nursery businessmen, Dealers and producers. Dealers are the commission agents they take stock from the producers and supply to the end consumer keeping a margin in final price as their commission. Plants price depends upon the size of pots, age of plant, availability of plant, plant type and initial investment. Pot size includes the size ranging from 10" to 48". This size is estimated on the basic of the width of the pot. The most benefited person during all the supply chain of nursery business was commission agent which was a thing of common observation. There is a lack of knowledge about medicinal value of all the available plants in Pattoki despite the fact that the most diverse flora of Pakistan is present here. These plants can be used to fight against the emerging diseases of new age if there medicinal value is calculated by precise surveys of Pattoki (Ahmed et al., 2015; Ahmed et al., 2014; Barkatullah et al., 2015; Bibi et al., 2014a; Bibi et al., 2014b; Ishtiaq et al., 2015; Murad et al., 2013; Rashid et al., 2015; Shah et al., 2016). It was evident from the fact that majority of plants are subtropical to tropical as Pattoki lies in the subtropical to tropical region of Pakistan. But the most fascinating effect that can be highlighted is that the plants belonging to temperate climate are surviving equally as well. This fact can be used for further study of flora of Pattoki in relation with its unprecedented climate.

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