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Survey of *boraginaceae* family from taif Saudi Arabia peninsular

Ali Majrashi

Department of Biological Science, Faculty of Science, Taif University, Taif, **Saudi Arabia**

***Correspondence:** majrashiaah@gmail.com **Received 12-02-2020, Revised: 18-06-2020, Accepted: 02-08-2020 e-Published: 28-09-2020**

Weeds are consider as a significant important biological indicator of crop production resulting to yield loss of about 50%. Identification of weeds is very difficult from their morphological features. Despite wees are the real challenge in farming in the developed, developing and underdeveloped countries. Nevertheless, weeds ar also part of primary producers. Major constrain of crop production are weeds but they are also consider as important aspect of agricultural system in the world. Weeds are wild plants grow in an environment without the contribution of any human activities that that have positive or negative impact to the environment. The aim of the study is to documents weeds of family *Boraginaceae* and agricultural crops grown in Taif region of Saudi Arabian kingdom in a mountain with an elevation level of (Area A = Al sail 1700 m, Area B = Al Wahat and Al Watit 1500, C = Leeih 1500, D = AL Gaim and Saisad 1500, F = E = Al Shafa 2200 m, F = AL Hada = 2000 m). The study was carried out based on enviromental survey. Diverse number of weeds were identified and collected from the examined study area. Results revealed aggressive weeds species. *Echium vulgars, Heliotropium currsivicium and Sisymbrium orientale.* Similarly, ten agricultural crops were documented from the study area; *Portulaca oleracea, Ficus carica, Phoenix dactylifera, Solanum melongena, Punica granatum, Solanum lycopersicum, Vitis spp, Vicia faba, Cucurbita pepo* and *Rosa damascene.* Findings from the studyof the will aid management control and proposing research toward improved new weed control measures. Also has provided insight on purposeful weeds control in Taif Area.

Keywords: Weeds; *Asteraceae*; Taif Area; Saudi Arabia

INTRODUCTION

Weeds are consider the major challenge of agricultural crop production in the world. This is due to the pressure of the population and constant usage of the agricultural land (Triplett & Dick, 2008). They are also described as undesirable plants grown in a reserved or unreserved environment. The above assumption was made due to the negative consequences of weeds causing to the wanted crops or agricultural crops. Weed this are plants always competing with the other organisms around them. Weeds council pathogens and insect directly or indirectly leading to damage to the crops (Jabran, Mahajan, Sardana, & Chauhan, 2015). The negative damage caused by weeds species vary from species likewise vis crop to crop (Johnson, Davis, Kruger, & Weller, 2009). The environment also determine the magnitude of the lost caused by the weeds in an area (Owen, 2008). All over the world, it has recorded approximately more than 14% of the agricultural lost was caused by different species of weeds (Pimentel, Acquay, et al., 1992). Weeds are always becoming aggressive despite the control putting in place by the government and all other stake holders (Daehler, 1998). It has been previously reported if no serious majors were taken against the

unwanted crops (Pimentel, Zuniga, & Morrison, 2005). The agricultural loss will be above 40% as a results of weed attack. It has been documented agricultural production (Zimdahl, 2018). Developed countries reported 5% loss in agricultural production yearly. Less developed countries documented 10% yearly on their crop production as a results of attacks by the weeds (Liebman, Gallandt, & Jackson, 1997). Least developed nations only realised 70% of agricultural product and 30% loss due to weeds attack (Iyagba, 2010). Developed countries invest much in weeds control than any other pest attacking agricultural product. While the other part of the world less and least developed countries spend a lot of money in weeding of their agricultural land (Pimentel, 1996). It has been previously report 50% time spend in farming is for land clearing. Agricultural crop protection against attack from the weeds is the most important aspect of farming activity by the farmer (Abdulrahman, Ali, Fatihah, Khandaker, & Mat, 2018a). Allowing weeds to be grown in the cultivated land during the early development of the crop resulted in poor performance of the plants (Abdulrahman, Ali, Fatihah, Khandaker, & Mat, 2018b). Thereby leading to competitions among them. For a small scale farmer, control of weeds is most labour activity. Weeds becoming consisting to the environment with high rainfall and high temperature. The following phenomenon encouraged the growth of the unwanted plants in the farm (Abdulrahman, Ali, & Moneruzzaman). Despite weed are consider as the major constrain of agricultural production. Weeds are still consider as agent of pollination and primary producers within the agricultural system (Abdulrahman, Fatihah, Khandaker, Ali, & Mat, 2019). Thereby making them important component of agroecosystem. It has also established the flora of weeds are changing over the decades all over the world. Increase in some species of weeds are recorded and decline in also in some selected species reported. In an ecosystem weeds plays a vital role in biodiversity diversification. Biological knowledge is needed of each species of weeds in an ecosystem. Knowing fully the biodiversity of the weeds in a population community will aid in balancing the needs for weeds management. Management and control of weeds species is of major importance all over the word in order not to overpower plants with economic importance (Moneruzzaman, Hossain, Sani, & Saifuddin, 2008a). Special trained personnel need to carry sensitization towers to farmers and populace on the needs for control and management of weeds diversity in our habitat. Immediate measures need to put in place like biological control, surveys, mechanical, cultural methods for efficient control and up to date data base of species composition in each community. For proper records and management study of documentation should be carried out at an interval period of time (Moneruzzaman, Hossain, Sani, & Saifuddin, 2008b). Middle East is a region with geographical location of a diverse complex topography containing high mountains above five thousand metres with four hundred metres sea level depression, Foothills Mountain, alluvial plains and elevation of plateaus. Climate of the region varies from Mediterranean to extremely subtropical climates (Moneruzzaman Khandaker, Nasrulhaq Boyce, Osman, & Sharif Hossain, 2012). Extremely cold to high desert rainless of plateau. Their vegetation is made up of forest of humid dense, dry steppes, moist semi desert and dry steppes. According to the geographical and phytological history of Middle East it is consider as period of human Pleistocene highly influenced the floral vegetation leading to domestication of the native plants in the environments. Not much investigation was carried out on the Saudi Arabia vegetation. Madinah, Badr and Jeddah vegetation was described. Elaborated studies of the mountains was carried out according to their elevations in relation to diversity change. Hijaz Central Mountain was investigated according to the abundance of plant species in the mountain. Discontinuation was previously reported in Taif environments. Raud floristic diversity and vegetation was reported to contain some alien plants and animal species. Comparison analysis of Saudi Arabia central region and Riyadh was documented on the plants and animal diversity. With the current informational background not enough literature on the distribution and diversity of Saudi Arabia plants species. Studies on the level of elevation of Saudi Arabian habitat will provide baseline information on the economic importance of the agricultural crop and weeds competition. Ornamental, floricultural and horticultural crops cultivation create sources of income to the people of Saudi Arabian Peninsula. The Saudi Arabian environment has African, Mediterranean and Asian endemic species. Pteridophytes and Gymnosperms represented the Saudi Arabia flora with total no of 2250 species belong to 142 families. 242 species are endemic and 600 are rare endangered. The present study documented the diversity of Boraginaceae weeds

in in area of Taif Saudi Arabia. The study addressed the challenge of managing of Boraginaceae family in Taif.

MATERIALS AND METHODS

The Study Area (Taif Area) Figure 1 on the Sarwat Mountains eastern slopes at the altitude of 1700 m above sea level of the Mountains with increases toward the head to the south and west up to the level of 2500 m, located around N 20-22° and E 40-42°.

The vegetation of the Taif is famous in agricultural activities among the communities of Saudi Arabia Kingdom. With the total preserved area for agricultural activities of more than 594 000 hectares and approximately 594 000 farms. The study was carried at mountain at an elevation level of (Area A = Al sail 1700 m, Area B = Al Wahat and Al Watit 1500, C = Leeih 1500, D = AL Gaim and Saisad 1500, F = E = Al Shafa 2200 m, F = AL Hada = 2000 m) Figure 2. The collected sample where identified and herbarium sample was prepared for further identification and deposition in herbarium. The weed was collected in an area where cultivation is taking place. The diversity and determination of the species were carried out based on the methods described by Majrshi & Khandaker, (2016).

DATA ANALYSIS

Analysis of the Data collected were converted to log+1 prior to statistical analysis and further subjected to one-way ANOVA. Means were tested for significant difference, data with significant difference were further subjected to t-tests. The mean difference was significant at p≤0.05 level.

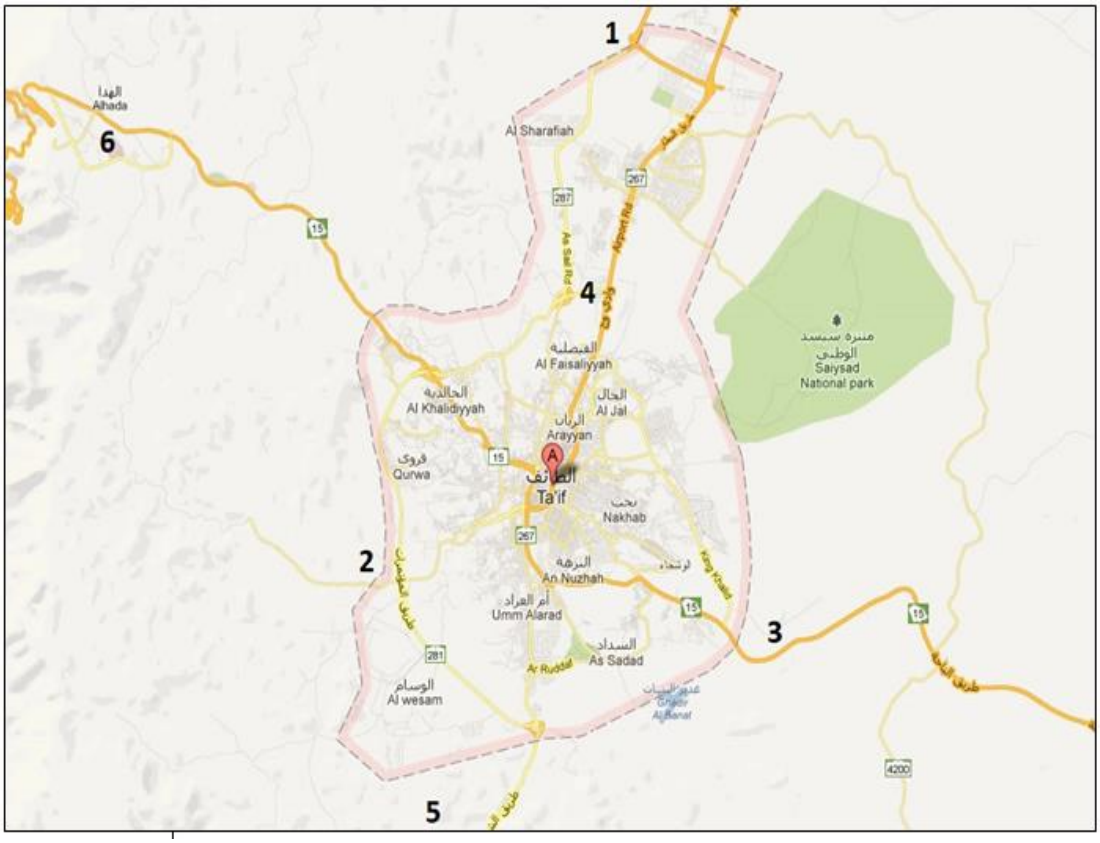

Figure 1; *Asteraceae* flora in Taif Saudi Arabia kingdom

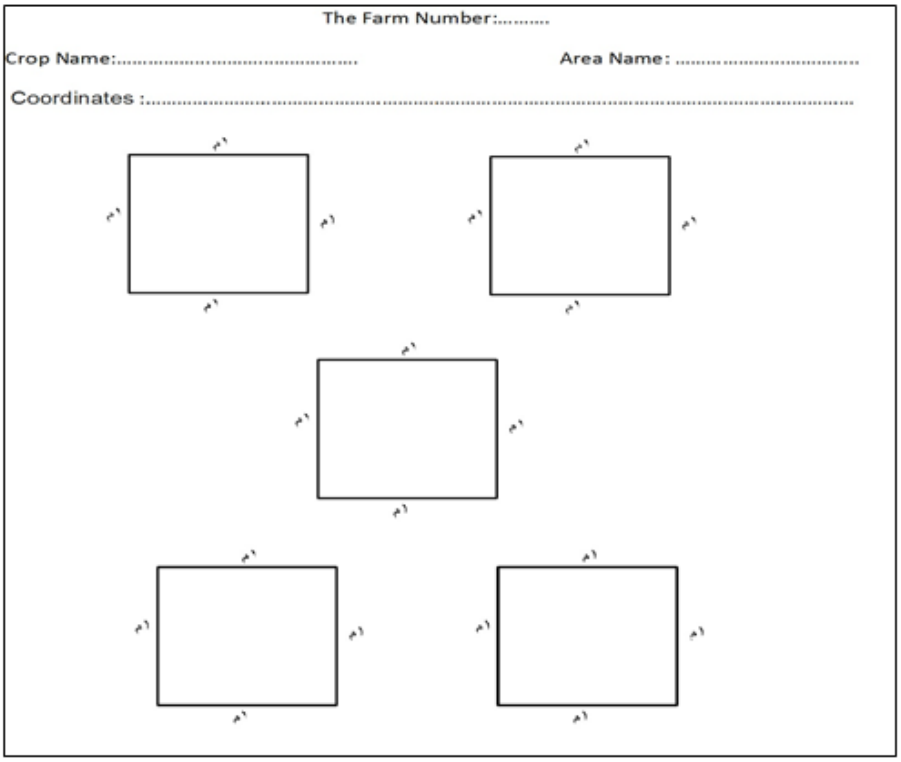

Figure 2: Experimental design and quadrats arrangement of weeds in Taif crops at Six Areas

RESULTS AND DISCUSSION

The study documents 3 species. *Echium vulgars, Heliotropium currsivicium* and *Sisymbrium orientale.* Highest number of species was recorded in Area 6 with *Sisymbrium orientale* 263 with total number in all area 104 species. The study, similarly documented ten agricultural crops from the study area; *Portulaca oleracea, Focus carica, Phoenix dactylifera, Solanum melongena, Punica granatum*

Solanum lycopersicum, Vitis spp., Vicia faba, Cucurbita pepo and *Rosa damascena* as shown in (Table 2).

Weeds are consider generally as unwanted, undesirable having significant negative effect when competing with other agricultural crops. The pressure of the weeds is becoming a serious issues (Harris, 1988). Researchers have documented less attention was given was given to the destruction of weeds habitats in the tropical environments which resulted to damaging of the agricultural crops (Clements et al., 2004). It has been reported more than 31,000 species of plants are weeds. Almost 300 are troublesome weed that has effect on the environments (Kleijn et al., 2004). Significant amount of yield loss was a results of the weed effects on the plants. The goals of a weed scientist are understanding distribution, nature and abundance of weed species within an agroecosystem is an important aspect of the study (Enninful, 2019). Geographical distribution of the weeds species is termed as abundance, understanding the biological life cycle of the weed species is termed as nature and measuring the frequency of the individual weeds species is termed as abundance (Majrashi). Concept of studying the distribution and abundance of weed species in a particular landscape aids in determining how the population affect or change the compositions overtime (Abdulrahman, Ali, Fatihah, Khandaker, & Mat, 2018b). Knowledge of abundance, density and distribution of weed in a landscape is paramount or prerequisite for its effective management (Abdulrahman, Ali, Fatihah, Khandaker, & Mat, 2018a). It also helps in knowing how the pressure is affecting agricultural activities in the area. Diversity and abundance of weeds vary greatly with the location of the environment and agricultural activities (Pimentel, Stachow, et al., 1992). Both for biodiversity and agricultural practices needs exact estimation of the weeds population in an area (Marshall et al., 2003).

Table 1: Weeds species documented from Taif Saudi Arabia Peninsular

Species Name	Weed Number						Total
	Area1	Area2	Area3	Area4	Area5	Area6	
Echium vulgars		80				17	80
Heliotropium currsivicium	233		77	14			14
Sisymbrium orientale			6		37	268	104
Total							**799**

Table 2: Agricultural crops documented from Taif Saudi Arabia Peninsular

Agricultural crops				Weeds number				
Species name	English name	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Total
Portulaca oleracea	A man				32			32
Ficus carica	Common fig	17	41					58
Phoenix dactylifera	Date plam	56		3		12		71
Solanum melongena	Eggplant	23						23
Punica granatum	Pomegranate		26					26
Solanum lycopersicum	Tomato	17						17
Vitis spp.	Grape		8		84			92
Vicia faba	Broad bean			14				14
Cucurbita pepo	Courgette	1	37					38
Rosa damascena	Flower	6						6
Total								1228

The competition results in the affecting of the quality and quantity of the yield (Marshall et al., 2003). Disease arose to the cultivated crops from the infestation of the weeds. Weeds infestation also result in the attraction of insect to the cultivated lands. Reported by Majrshi & Khandaker, (2016) weeds are responsible for the loss of more than 50% of annual agricultural products all over the world. Averagely, it has been estimated 10% of loss in agricultural product are documented annually in less developed countries and more than 20% in developed countries. Thus, knowledge of the weed species community composition is an important component of weed strategic management, essential in setting priorities for weeds species management and research purposes. Weeds compete for natural resources with crops, such as nutrients light and water (Thorp & Lynch, 2000). Promotion of diseases problems are also associated to weeds, slow down harvesting, weed serve as alternative hosts to insects and many harmful diseases, leads to increase in production cost, devaluate the crop value in the market and also increase the chances of fire outbreak before harvesting. Weed also reproduce similar to order species of plants. Thus, the weeds quantity and quality in the soil are the sole responsible for the determination of the situation within the arable land. The term weeds are interchanging as a plant grown in a place not required for utilisation (Tuck et al., 2014).

CONCLUSION

Weeds are consider the most dangerous species on earth to crop protection and crop production. They caused significant % of yield loss. The study identified aggressive weeds in the area. The information provided will serve in the management of Taif weeds in order to avoid the effect of allelochemicals of weeds to the agricultural crop. The following weeds can also be utilised in the production of pesticides and herbicides. Further studies should be carried out on the chemical contents of the plants.

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CONFLICT OF INTEREST

The authors declared that present study was performed in absence of any conflict of interest.

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AUTHOR CONTRIBUTIONS

The author contributed to all parts of the research.

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