Summary

The present study aims at preparing a recent checklist for the plant species and plant communities, which characterize Sharkiya Governorate. The checklist were analysed in terms of taxic diversity, life forms, dispersal types, sex form, chorological affinities rarity forms, environmental and economic importance, and physical defense of the recorded species. This study aims also at identifying the vegetation types and environmental factors that govern the gradual change in vegetation structure. The other aims include preparing a consulting herbarium for these species in Botany Department, Faculty of Science, Benha University and building up a computerized database dealing with the botany, ecology, biogeography, environmental and economic importance and physical defense of the recorded species.

30 field trips were carried out to cover almost – all the main and minor habitats and community types in different locations in the study area. Specimens of the present species were collected from different sites in each location. Floristic records were carried out based on the presence- absence of species taking in consideration the type of habitats and plant communities, local abundance, sex form, dispersal type, environmental and economic importances of each species. The life forms were identified following Raunkiaer (1937), while the sex forms were assessed in the field and cheeked with those indicated in Zohary (1966 and 1972), Feinbrun-Dothan (1978 and 1986), Mashaly (1987), El-Sheikh (1989 and 1996), Al-Sodany (1992 and 1998) and Mousa (1998).

Freshly collected seed samples were used to assess the seed dispersal types of the recorded species following the scheme of Dansereau and Lems (1957). Chorological affinities were gathered from Täckholm (1956 and 1974), Zohary (1966 and 1972), Wickens (1976),

Feinbrun-Dothan (1978 and 1986) and Boulos (1999, 2000 and 2002). The rarity forms were assessed according to scheme of Rabinowitz (1981). The environmental importance of the recorded species was gathered from Simpson (1932), Täckholm (1974), Ayyad (1998) and Zaharn and Willis (2003), while their economic importance was collected from the local inhabitants, herbalists and the available literature. The physical defense of the recorded species was evaluated in the field and checked with those indicated in Zohary (1966 and 1972), Feinbrun-Dothan (1978 and 1986), Täckholm (1974), Heneidy and Bidak (1999) and Boulos (1999, 2000 and 2002).

The total number of plant species recorded in the present study was 231, belonging to 152 genera and 45 families. Gramineae (50 species), Composiate (34 species), Leguminosae (21 species) were represented together by 105 species or about 45.5 % of the total number of the recorded species. Chenopodiaceae (14 species), Cruciferae (10) and Caryophyllaceae and Euphorbiaceae (14) contribute 16.5 % of the total number of species. Collected species were identified by the author and kept in Herbarium of Botany Department, Faculty of Science, Benha University.

Five major habitats dividing into 13 minor habitats were identified in the study area: desert includes (sand flats, sand dunes and salt marshes), urbanized areas include (railways, highways, abandoned fields and waste land), cultivated lands include (fields of summer crops, fields of winter crops and orchards), wetlands include (irrigation and drainage canals) and reclaimed lands. The present study indicated that the therophytes was the most represented life form and had maximum relative occurrence in the fields of winter crops and in Leguminosae, followed by geophytes-helophytes in railways and Gramineae and hydrophytes in the drainage canals and families of < 5 species. On the other hand, phanerophytes and parasites were the less represented life

forms. Phanerophytes had the maximum relative occurrences in railways and families of < 5 species, while the parasites had the maximum in fields of winter crops and families of < 5 species.

The present study indicate that the bisexual species (i.e. hermaphrodites) were the most represented sex from within the flora of Sharkiya Governorate, and had the maximum relative values in salt marshes, parasites, Gramineae and Leguminasae. Monoecious species had the maximum relative occurrence in reclaimed lands, hydrophytes and families of < 10 – 5 species; while dioecious species had the maximum in railways, phanerophytes and families of < 5 species, and Polygamous species had the maximum in orchards, phanerophytes and families < 15-10 species.

The present study indicate that the ballochoric and pogonochoric species were the most represented within the flora of Sharkiya Governorate, while the cyclochores and barochores were the less represented. Ballochores had the maximum relative occurrence in the wastelands and chamaephytes and pogonochores in the sand dune and phanerophytes. Cyclochorse had the highest relative values in the sand flats, geophytes-helophytes and barchores in the fields of summer crops and therophytes.

Mediterranean elements were the most represented within the flora of Sharkiya Governorate and had the maximum relative occurrence in the sand flats, hemicrypyophytes and Leguminosae. Saharo-Arabian elements had the maximum relative occurrence sand flats and phanerophyts, Sudano-Zambezian in the railways and phanerophytes and endemics in the drainage canals and chamaephytes.

The present study indicate that the SNN cell (small range - narrow habitat – non abundant species) was the most represented, while

the SWN cell (small range – wide habitat – non abundant species) was the less represented in the flora of Sharkiya Governorate. The SNN cell had the maximum relative occurrence in the sand flats and hydrophytes and the SWN cell in the abandoned fields and hemicryptophytes.

The segetal and ruderal weeds were the most represented specie in the study area, while the nitrogen fixers and water purificators were the less represented. Segetals had the maximum relative occurrence in the fields of winter crops and parasites, while ruderals in the sand flats and geophytes-helophytes. Water purificators had the maximum relative occurrence in the sand flats and hydrophytes and the nitrogen fixers in the fields of winter crops, therophytes.

The grazed species were the most represented followed by the medicinal and human edible species. On the other hand, fuel and timber uses were the less represented. Grazed species had the maximum relative occurrence in the abandoned fields and geophytes-helophytes, while the medicinal plants had the maximum in the sand falts and hemicryptophytes. Human edible species had the maximum in the reclaimed lands and therophytes, fuel species in the slat marshes and phanerophytes and timber species in the railways and phanerophytes.

The present study indicated that the first (plants with hairy-leathery leaves or hairy stems and strong – fragrant odour) and second (plants with modified parts “spines or spinescent branches”) groups of physical defense were the most represented within the flora of Sharkiya Governorate. Group VI (hiding plants) was the less represented within the species. Group I had the maximum relative occurrence in reclaimed lands and hemicryptophytes, group II in salt marshes and geophytes-helophytes and group VI in railways and therophytes.

Sixty-nine vegetation groups identified in Sharkiya Governorate categorized according to their leading species into 33 associations, which in turn arranged according to their habitat preferability into 5 groups; associations of wet lands, cultivated lands, reclaimed lands, urbanized areas and desert habitat. The application of TWINSPAN classification on the floristic composition of these vegetation groups led to classify them into 5 major vegetation types (VT): VT I characterized the water zones of the drainage and irrigation canals of Sharkiya Governorate, VT II characterized the cultivated lands in whole Sharkiya Governorate, VT III occupied the reclaimed lands, VT IV occupied wide habitat gradients (railways, abandoned fields, highways and waste lands) and VT V desert habitat of Sharkiya Governorate. The environmental significance of the DCA axes 1 and 2 was investigated by simple liner correlation. The soil variables that correlated positively with axis 1 were organic matter, PH, phosphorus and chloride and that which correlated negatively were fine sand, calcium and sulphate. Axis 2 correlated positively with coarse sand, magnesium and sodium and negatively with calcium and sulphate.