Summary

Imperata cylindrica L. Beauv and *Desmostachya bipinnata* L. Stapf. are perennial grasses belonging to the largest family in the flora of Egypt (Gramineae). These grasses are well developed in saline and non saline habitats and distributed in the different phytogeographical regions of Egypt and the world they well growing in the undulated farmlands, canal banks, on the roadsides of the different ways, on the two sides of railways and in sandy habitats a round the salt marshes. These grasses are characterized by an scabrous rhizomes, run through the upper layer of the soil at depth of 2-3 feets and play important role in the sand binder. The characteristics fibers of these grasses were one of the main objectives of this study which may use in the future for industry of paper and ropes. The ancient Egyptian were recorded the importance of halfa grasses through their drawing on walls of their tombs These plants were used in the different handcraft industries as paper, ropes, pots, receptacles and baskets. Morphologically there are a great resembles between the two species particularly in the absence of the spike. In fact, it is difficult to dissociate and identify them, without their spikes but it can by using of the microscopical analysis. This study includes field studies, laboratory investigations and Herbarium works. For compare and analysis the auto-ecology of these two grasses. From the general survey for the almost phytogeographical regions of Egypt a distribution map was drawing. It clarify that Wadi El-Natrun is the best habitats for growing of *Desmostachya* with high density while, Siwa Oasis and Bahariya Oasis are the best habitats for *Imperata* growing. The floristic composition of communities dominated by these two grasses elucidate that the associated species which recorded were less than the expected number, it may be result from the allelopathic effect of these grasses on the growth of the

other plants. *Imperata cylindrica* has 14 associated species belonging to different families and the most frequent species is *Phragmites australi*s While, *Desmostachya* has only two associated species *Alhagi graecoru*m and *Bassia indica*. These grasses have a restricted flower season where *Imperata* flowers in the spring and *Desmostachya* flowers in the months of August to November. On the other hand the laboratory analysis for the soil samples were investigated to determinate the physical (textures of soils) and chemical properties (cations, anions, calcium carbonte, organic carbon, PH, and electrical conductivity). The results of the physical analysis indicated that Coarse, medium and fine sand represent a higher values in the soil dominated by *Imperata* while, the habitats dominated by *Desmostachya* have approximate values of sand and clay contents. Although, the results of chemical analysis demonstrated that, Electrical conductivity was elevated in the soil samples represented by *Imperatac*, the soil samples of Wadi El-Natrun dominated by *Desmostachya* show the highest value of electrical conductivity. The results indicated that the soil moisture contents varied in the different locations according to the climatic features which influenced on the values of biomass where, the highest value of biomass recorded in Siwa Oasis dominated by *Imperata* was (998.9gm/m²) while, the highest biomass value in the locations dominated by *Desmostachya* was (735.6 gm/m²)The vegetation analysis involves counting of the density, cover and frequency to calculate the importance value for the study grasses and their associated species. The importance values were inter in **TWINSPAN** classification program and the most important results that, all stands of the study grasses were classify in to six groups, three dominated by *Imperata* and the other dominated by *Desmostachya*. **(CCA)** Canonical Corresponding Analysis program was used to specify the relationship between the soil factors and the classification groups. On the other aspect the laboratory investigation

were made on the collected plant samples from each study locations to eliminate the chemical constitutions of total nitrogen, crude protein, crude fiber and the water contents. The highest values of crude fiber were 47 % that, recorded in the samples of *Desmostachya* while, the highest value of water contents were recorded in the samples of *Imperata cylindrica.* Also this study includes measuring of fiber length in leaves and culms of the two grasses. The results indicated that, halfa grasses contains high percent of the long fibers reach to 80 % which, perhaps use in the industry after complete the qualitative analysis on it. The morphological measurements involved leave length, culms length, leave width, spike length and the height of the plant. The comparison of the morphological measurements demonstrated that *Imperata* has two groups different in the height; leave length, leaves width and length of the spikes, so it may be confirm that *Imperata* has two verities in Egypt. Transvers sections were made in the leaves and culms of the two grasses to compare and identify of the internal structures for these grasses and the microscopical analysis shows the fiber masses distributed in the leaves and culms sections.