1. Ecology of weeds and invasive plant species in the newly reclaimed areas of Nile Delta Egypt

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Abstract:

The ecology of weeds and invasive plant species in some newly reclaimed areas in Nile Delta of Egypt provides a quantitative assessment of the vegetation structure, the main soil characteristics and an evaluation of the relationships between the recognized vegetation groups and environmental attributes. The application of TWINSPAN classification led to the recognition of four vegetation groups in each of winter and summer seasons. The groups identified in winter crops are: group A dominated by Pulicaria undulata, group B codominated by Cynodon dactylon and Chenopodium murale, group C dominated by Euphorbia peplus and group D codominated by Bidens pilosa and Cynodon dactylon. Groups of summer season are group A dominated by Cynanchum acutum, group B dominated by Cynodon dactylon, group C dominated by Portulaca oleracea and group D dominated by Cynodon dactylon. The correlation between vegetation and soil variables is indicated on the ordination diagram produced by Canonical Correspondence Analysis (CCA) of the biplot species-environment which showed that, the percentage of sand, silt, clay, sodium adsorption ratio (SAR), potassium adsorption ratio (PAR) and total dissolved phosphorus are the most effective soil variables in winter season, while electrical conductivity, chlorides, porosity, pH value, sodium adsorption ratio (SAR), potassium adsorption ratio (PAR), calcium, magnesium, sodium and organic carbon are the most effective edaphic factors in summer season

Published in: Journal of Environmental Scieces (40):69:90. 2010

2. Habitat and plant communities in the Nile Delta of Egypt. II. Irrigation and drainage canal bank habitat.

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Abstract:

The present study provides quantitative analysis of the vegetation and spatial variations of environmental factors controlling the abundance and distribution of vegetation in canal and drain banks in the Nile Delta region of Egypt. Five vegetation groups have been recognized: group A codominated by Arundo donax and Polygonum equisetiforme, group B codominated by Rumex dentatus and Polypogon monspeliensis, group C dominated by Eichhornia crassipes, group D codominated by Phragmites australis and Echinochloa stagnina and group E dominated by Typha domingensis. The total number of weeds recorded in the study area is 113 species belonging to 36 families. Therophytes (48.67%) and geophytes (14.16%) are the most frequent life-forms. The major chorotypes in the study area are Mediterranean (42.48%), Cosmpolitan (19.47%), Pantropical (13.27%) and Palaeotropical (12.39%). The relationships between the vegetation gradients and edaphic factors showed that, potassium and sodium cations, potassium adsorption ratio, chlorides, sodium cation adsorption ratio, pH value and water-holding capacity are the main controlling edaphic factors.

Keywords: Weeds, vegetation, soil factors, canals, drains, Nile Delta

Published in: Pakistan journal of biological sciences: PJBS **Volume:** 12 **Issue:** 12 **Pages:** 885-95 **Published:** 2009-Jun-15

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3. Habitats and plant communities in the Nile Delta of Egypt I. Deltaic Mediterranean coastal habitat.

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Abstract:

The present study aims at investigating the vegetation-soil relationships in the Deltaic Mediterranean coastal land of Egypt. The Deltaic coast of the Mediterranean Sea of Egypt can be distinguished into five habitat types, namely: sand dunes, salt marshes, sand sheets, sandy fertile lands and lake shorelines (Manzala, Burullus and Idku). These habitats are categorized into four vegetation groups namely, group A dominated by Rumex pictus, group B codominated by Pancratium maritimum-Cyperus capitatus-Lolium perenne, group C codominated by Arthrocnemum macrostachyum-Atriplex portulacoides-Typha domingensis and group D codominated by Echinochloa stagnina-Typha domingensis-Phragmites australis. One hundred and thirty plant species are recorded in this coast and belonging to 38 families. Out of the recorded species, about 41.54% are annuals, 2.31% biennials and 56.15% perennials. The percentages of the life-form indicated that, therophytes attained the highest representation (43.85%). The floristic analysis revealed that, 55.38% of the recorded species are Mediterranean elements. The ecological amplitudes of the leading species along the gradient of edaphic factors are discussed.

Key words: cadmium, carbohydrates, kinetin, photosynthetic activity, pigment, sorghum,yield

Published in: Pakistan journal of biological sciences: PJBS **Volume:** 11 **Issue:** 22 **Pages:** 2532-44 **Published:** 2008-Nov-15

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4. BILOGICAL STUDIES ON SOME WILD MEDICINAL PLANTS IN EGYPT

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The present investigation provides detailed ecological and microbiological studies on ten selected medicinal plants growing naturally in two different habitats in Egypt, namely north-east Nile Delta (El-Dakahlia Governorate) and desert (Cairo- Suez desert road and Wadi Hagul). The present study indicated that, the extracts of the tested wild medicinal plants which collected from two different habitats showed variable potentialities against the tested fungi (*Botrytis fabae, Fuarium solani, Fusarium oxysporum, Aspergillus flavus* and *Rhizocotina solani*).The extracts of *Achillea fragrantissima* and *Artemisia judaica* were found to have the most effective potentiality against most of the tested fungi. However, *Pulicaria undulata*, *Hyoscyamus muticus*, *Datura stramonium* and *Silybum marianum* showed a relatively moderate effect against most of the tested pathogenic fungi. Moreover, extracts of *Plantago major* and *Withania somnifera* showed the lowest inhibition effect against most of the tested fungal growth.There was positive effect for mixture extracts of three high potential medicinal plants namely: *Silybum marianum*, *Achillea fragrantissima* and *Artemisia judaica* on *Fuarium solani* and *Fusarium oxysporum* that was relatively higher than the effect produced from each of these extracts alone.

Key words: Ecology, microbiology, medicinal plants, tested fungi.**Published in**: Acta Botanica Hungarica 45 (1–2), pp. 113–126, 2003

Published in: Journal of Environmental Sciences, 2008; vol.36:173-197

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239:334-9.

5. Autecology and phytochemistry of genus Amaranthus in the Nile delta, Egypt

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Abstract

The present study deals with the ecology and phytochemistry of three Amaranthus species, namely: Amaranthus graecizans, A. lividus and A. viridis. The components of weed vegetation in the present investigation are classified by cluster analysis into four groups: group A is codominated by Amaranthus graecizans and Portulaca oleracea, group B is codominated by Amaranthus lividus and Cynodon dactylon, group C is codominated by Alternanthera sessilis and Echinochloa crus-galli and group D is codominated by Aster squamatus, Conyza bonariensis and Paspalum disticum. The ordination of the sampled stands applied by Detrended Correspondence Analysis (DCA) indicated that, the recognized vegetation groups are markedly distinguishable and having a clear pattern of segregation on the ordination planes. Also, the application of the Canonical Correspondence Analysis (CCA) showed that, soil texture, porosity, water-holding capacity, bicarbonate, sodium, soil reaction (pH), organic matter and electrical conductivity are the most effective soil variables which correlate with the distribution and abundance of weed vegetation in the study area. The seed germination under different levels of salinity, light, temperature and humidity is studied for the three investigated species. Phytochemically, the mean values of moisture, ash, total nitrogen, protein, total lipids, soluble sugars, glucose, sucrose, polysaccharides and total carbohydrates were determined. The elementary analyses together with qualitative and quantitative analyses of 16 amino acids were also carried out in the investigated plant species.

Keywords: Phytochemistry; Amaranthus; Seed germination; Autecology; Vegetation analysis

Published in: Asian Journal of Plant Sciences,7(2) :119-129