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PHYTOSOCIOLOGICAL STUDIES OF *PANICUM MAXIMUM* (JACQ) IN IMO STATE UNIVERSITY

[1]Umeoka, N., [2]Ogbonnaya, C. I. [3]Egbucha, K.C. and [4]Ohazurike, N. C.

1. Department of Plant Science and Biotechnology (Botany), Faculty of Science, Imo State University, Owerri, Imo State.
2. Department of Plant Science and Biotechnology, Faculty of Science, Abia State University, Uturu, Abia State.
3. Department of Plant Science and Biotechnology, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria
4. Department of Crop Science and Biotechnology, Faculty of Agriculture and Veterinary Medicine Imo State University, Owerri, Imo State.

Corresponding author: Dr. Egbucha K.C.

ABSTRACT:
Phytosociological studies enable the plant scientist to have more insight into the nature of such plant. The phytosociological study of weed flora from three sites in Imo State University, Owerri, Imo State was undertaken. The research was done between the month of July and September, 2016. The weeds grow abundantly in the areas under tropical climate and supported by a sandy-loam soil. The data indicated that Panicum maximum, Tridax procumbens and Eragrotis ciliaris are the most dominant species identified in the area. Phytosociological investigation showed a Panicum – Tridax – Eragrotis Plant community. Panicum was positively associated with Tridax procumbens, Eragrotis ciliaris and Maricus alternifolus. The interrelationship of Panicum maximum (Jacq) was thus determined. This study therefore is a contribution to the general ecology of the plant.

Key words: Physiological study: Weed flora: Abandoned farmland: *Panicum-Tridax-Eragrotis* Plant community.

INTRODUCTION

Phytosociology or plant sociology refers to the study of plant communities. Phytosociology is the branch of plant dealing with the plant communities, their composition and development as well as their relationship between species within them. It is the study of plant communities that make up a vegetation- including their inception and formation, their structure, and above all their composition [8]. It is useful to collect data to describe the population dynamics of each species studied and how they relate to the other species in the same community. Subtle differences in species composition and structure may point to differing abiotic conditions such as soil moisture, light availability, temperature, exposure to prevailing wind, etc. when tracked down over time, species and individual dynamics can reveal patterns of response to disturbance and how the community changes over time [6].

In this study, the phytosociological survey of the weed community is critical, because it can help to define what to do (how and when). In relation to the management of weeds, since possible condition of infestation and management are varied [7]. Weeds are objectionable plants that interfere with the activities or welfare of man [1]. Many plants species compete with crops and so quality to be called weeds. These same plants could be useful as livestock feed, human food, compost making, cover crops, medicinal herbs, fencing and many other domestic uses depending on the localities [1]. Weed phytosociology is the study of the characteristics, classification, relationship and distribution of weed communities. Weeds are generally a major constraint to crop production small holder farms of tropical Africa. Over 40% of the farm labour in small holder agriculture in developing countries is expended in removing weeds [1]. In this particular phytosociological study of weeds, *Panicum maximum* was taken into consideration.

Panicum maximum (Jacq) is a perennial tufted grass with a short, creeping rhizome. The stems of this robust grass can reach a height of up to 2m. As the stems bend and nodes touch the ground, roots and new plants are formed. The leaf sheaths are found at the bases of the stems are covered in fine hairs. It remains green until late into winter. It is considered to be the most valuable fodder plant in the area where it is distributed. It has a high leaf and seed production and is very palatable to livestock. It may become a persistent weed, especially in cultivated areas such as sugar cane fields. It should be controlled in the seedling stage, as it is very difficult to remove later when the grass has reached maturity. The present study was undertaken to determine the following objectives: (1) to determine the phytosociological characters of *Panicum maximum.* (2) to identify the floristic composition of the weed populations of *Panicum maximum* in Imo State University, Owerri, Imo State. (3) to determine the interrelationship of *Panicum maximum* with other plants in a community.

MATERIALS AND METHODS

The area under study consisted of three sites all in Imo State University, Owerri, Imo State, Nigeria. The sites were situated at latitude 5^010^1N and 6^00^1N and longitude 6^035^1E and 7^00^1N in the southern eastern zone of Nigeria. Studies in this area were carried out between July and September 2016. In each of the sites, morphological studies of the plants were examined for the following features: height of stem, length of leaf, breath of leaf, area of leaf, depth of the longest root. Under quantitative measurement of abundance, density, coverage and percentage frequency were obtained. A quadrat size of 100 x 100cm

was used. The quadrat was laid 30 times randomly in each of the sites and the number of plant species rooted within the quadrat was recorded. Each of the sites was surveyed by means of quadrat subdivide by string into small quadrats [2]. 30 quadrat was randomly laid in each of the sites. Once laid, a completed species found actually rooted was made. To each of the species was assigned two figures, the first one corresponding to the number (density) and the other to the degree of cover. The sum of the relative density, relative frequency and relative aerial cover gives the Importance Value Index [5]. The observed X^2 values were compared with the expected values (as read, the standard X^2 table at one degree of freedom and 5% level of significance). The association between *Panicum maximum* and the named species was positive when the X^2 calculated is greater than the X^2 tabulated [4].

DISCUSSION OF RESULTS
   A. Quantitative measurement of Abundance
       1. Density

It is an absolute measure of abundance of plant [4]. Plant density is a tool that can be used to diagnose the health of your lawn, stem the invasion of invasive species, or just learn more about the fauna of a particular area. In this study, plants with the highest density were *Panicum maximum, Tridax procumbens, Eragrostis ciliaris, Maricus alternifolins.*

       2. Coverage
The abundance of plant species are often measured by plant cover. The degree of a cover of a species allows us to determine the dominace of a species, the species having the highest cover in this study were *Panicum maximum, Tridax procumbens, Eragrostis ciliaris, Maricus alternifolins.*

       3. Frequency
Frequency is the number of times a plant species is present in a given number of quadrats of a particular study area. The frequency of a species is a measure of the chances of funding it with any one throw of a quadrat in a given area [4]. Frequency is often expressed as a percentage and sometimes called a frequency index. The species having the highest frequency in this study were *Panicum maximum, Tridax procumbens, Maricus alternifolins, Eragrostis ciliaris.*

   B. Phytosociological Investigation
   1. Phytosociological study
It is the foundation for detailed community analysis, classification, development interrelationship distribution as well as other causal factors. The concept used in this study for which there are obtained data is restricted to the qualitative analytical concepts.

   2. Importance Value Index (I.V.I)
In order to express the dominance and econological success of any species with a single value, the concepts of importance value index has been developed [5]. This index is the sum total of relative frequency, relative density and relative with I.V.I (Table 1) of 49.24, 36.35, 22.95 by *Panicum*

maximum, Tridax procumbens, and Eragrostis ciliaris, respectively. Community of Imo State University, Owerri (in relation to the plot sites used in this study) can be described as Panicum-Tridax-Eragrostis community, suggesting the dominance of *Panicum maximum* in those areas sited.

3. Association of *Panicum maximum* with other plant species.

Association is a measure of the similarity of occurance of two species from the result of the chi-square (X^2) text (Table 2) *Panicum maximum*, *Eragrostis ciliaris, Maricus alternifolins* and *Emilia coccinea* were found to be positively associated with *Panicum maximum*. This however, does not insinuate that the presence of one causes the occurrence of the other but more probably they respond to similar combination of environmental factors [3].

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