

phytosociological studies of *tridax procumbens*: A case study of imo state university, owerri, imo state

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Abstract

To have more insight into the nature of plant, plant scientists carry out phytosociological studies on such plant species. The phytosociological studies on *Tridax procumbens*. Linn was carried out at Imo State University, Owerri, Imo State between the months of July and September, 2018. *Tridax procumbens* Linn grows abundantly in the areas under tropical climate and supported by a sandy-loam soil. Morphological features showed a range of variations. Phytosociological investigation showed a *Tridax*- *Mitracarpus*-*Digitaria* plant community. *Tridax procumbens* was positively associated with *Digitaria horizontalis*, *Mitracarpus scarber* and *Vernonia cinera*. The Inter-relationship of *T. Procumbens* was thus determined. This study therefore is a contribution to the general ecology of the plant. Phytosociological studies helps plant scientist to have more knowledge into the nature of plant species. This study is a contribution to the general ecology of the plant *Tridax procumbens*. The study also shows that it has close association with *mitracarpus Scarber* and *Digitaria horizontalis*. More work should be carried out to find out if these plant species flower and produce seeds at the same time or not.

Keywords: Physiological Study, *Tridax Procumbens*, Weed Flora, *Tridax*- *Mitracarpus*-*Digitaria* Plant Community.

1. Introduction

Tridax procubens (Linn.) is a common medicinal herb used by ethno-medical practitioners. It has been found to possess significant medicinal properties against blood pressure, stomach ache, headache, wound healing, bronchial catarrh, malaria, dysentery and diarrhea. It also prevents hair and check hemorrhage from cuts and bruises, hence there is the need to know its abundance, development and its phytosociological relationship with other weeds. It reportedly was introduced into Nigeria as an ornamental in the early 1950, and after many years, the population began spreading to other areas, especially along road – sides and in artificial pastures. *Tridax procumbens* has been described botanically by Holm et al., (FAO, 1998).

Though considered a weed, this C₃ plant is especially cherished by rabbits (AO – AC., 1996), and also sometimes used as green feed for poultry, and to stop bleeding in certain Indian villages (FAO, 1998), Kalu et al., 1996). In India analyzed mature plants are found sugars, sterols and tannins but no alkaloids or glycosides. In Nigeria studies carried out so far have been concerned with its germination (Kowal, 1968), ecology (Ogbonnaya, 1988), chemical composition (Hutchinson et al., 1965, Kalu et al., 1996), intra-specific composition (Minson 1971) and its value as dry season seed for rabbits (Adaku et al., 1969).

Phytosociology or plant sociology refers simply 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. A phytosociology system is a system for classifying these communities. (Mishra et al., 2012). The term phytosociology was coined by Joseph Paczowski in 1896. It is the study of plant communities that make up a vegetation - including their inception and formation, their structure, and above all their composition (Polunin, 1960).

The aim of phytosociology is to achieve a coefficient empirical model of vegetation using plant taxa combination that characterize units. Phytosociology is useful to describe the population dynamics of each plant species occurring in a particular community as well as to understand how they relate to the other species of the same community (Mishra *et al.*, 2012).

It is useful to collect such 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. (Onyemaechi and Ogbonnaya, 2014).

There are however, some concepts associated with phytosociology and the concepts therein may be grouped into main classes. The analytical concepts derived from the direct observation of the strands, and the synthetic concepts derived from the comparison of several similar stands of the same community (Segadas-Vianna., 1951). The analytical concepts are subdivided into two groups: - quantitative concepts concerning data derived from laying of quality and qualitative concepts concerning data obtained from direct observation of the plants without any relation to the type or size of quadrat used.

The quantitative concepts are abundance density, cover or dominance and frequency; and the qualitative ones are sociability, vitality, periodicity and stratification (Kershaw, 1979). However there are three synthetic concepts – presence, constance and fidelity but the concepts used is the quantitative concepts.

Tridax procumbens L. whose phytosociological studies is described here, belongs to the family Asteraceae– Aster family. *Tridax procumbens* Lin. is known as Public Work Department (PWD) weed in South Western Nigeria. It is native to Central America but now occurs throughout the tropical and subtropical belt of the world (Holm et al., 1997).

It is frequently found in annual crops, road sides, pastures, fallow land and waste areas, and occasionally in lawns, perennial and nurseries. Its wide distribution and importance as weed are due to its spreading stems and abundant seed production (Baker 1965).

The scope of the study is limited only to the phytosociological study of *Tridax procumbens* (Linn.) in Imo State University, Owerri, Imo State. The study would cover the plant composition, development as well as their relationship with other weed communities in the aforementioned environment. This study was therefore aimed at determining the following: (a) to identify the floristic composition of the weed populations of *Tridax Procumbens* in Imo State University, Owerri, Imo State, (b) to determine the phytosociological characters, distribution and the relationship of *Tridax procumbent* in Imo State University, Owerri, Imo State.

2. Materials And Methods

The area study consisted of two sites all in Imo State University, Owerri, Imo State. The sites were as follows: **Site I:** A piece of land in IMSU near the main school gate. **Site II:** A piece of land in IMSU near the former ICT unit.

The two sites are situated at latitude 5°10'N and 6°0'N in the Southern Eastern zone of Nigeria. The area records an average rainfall and temperature of 250mm, 27°C respectively. Map showing the sites is in figures 1, studies in this area were carried out between July and September, 2018. In each of the sites, plants were examined for the following morphological features: Height of stem (cm), length of leaf (cm), breath of leaf (cm), area of leaf (cm²) and depth of longest root (cm). For quantitative measurement of abundance, the following were obtained, density, coverage and percentage frequency. In Phytosociological Investigations, the Importance Value Index and the association of *Tridax procumbens* with other plant species were also obtained.

3. Discussion Of Results

Morphological Features

T Procumbens had a height range of 77.5±9.5cm. Maximum height occurred in site 11 followed by site 1. The leaf expressed on average length of 5.05±0.25cm, a breath of 3.3±0.1cm at the broadest middle and an average area of 16.64±0.32cm². The greatest rooting depth occurred at site with 71cm and the average depth of longest root was calculated to be at 66.5 ±4.5cm.

Quantitative Measurement of Abundance

In the investigation, plants with the highest densities were *tridaxprocumbens*, *mitracarpus scaber*, *cyperus esculentus*, and *Aspilia Africana* with densities of 6.52, 5.12, 2.43 and 2.34 respectively. The species having the highest cover in this study were *Tridax procumbens*, *Digitaria horizontalis*. *Mitracarpus scarber*, and *Aspilia Africana* with a coverage value of 55600, 49800, 43800 and 32400 respectively. The species having the highest frequencies in this study were *Tridax Procumbens*, *Mitracarpus scarber*, *Vernonia Cenera* and *Euphorbia heterophylla* with frequency values of 58, 43, 39 and 38 respectively.

Phytosociological Investigations

Importance value index (I.V.1)

From the study the species were arranged in decreasing order of the Importance Value Index (I.V.1) with *Tridax Procumbens* having an important value index of 44.80. *mitracarpus scarber*, *digitaria horizontalis* and *Aspilia africana* with importance value Index of 34.77, 24.17 and 20.11 respectively. The species with the lowest importance value Index was *Panicum maximum*, *paspalum conjugatum*, and *potulaca oleracea* with an I.V.1 of 0.257 each.

Association of *Tridax procumbens* with other Plant species

In phytosociology, association is used in the concrete sense as a measure of the similarity of occurrence of two species (Goldsmith and Harrison, 1976). From the result of the chi-square (X^2) *digitaria horizontalis*, *Mitracarpus scarbar*, and *Vernonia cinera* with X^2 value of 22.24, 13.24 and 7.63 were passively associated with *T. procumbens* in sites investigated. Others were found to be growing with the experimental plant due to chance fluctuation.

4. Conclusion

Phytosociological studies helps plant scientist to have more knowledge into the nature of plant species. This study is a contribution to the general ecology of the plant *Tridax procumbens*. The study also shows that it has close association with *mitracarpus Scarber* and *Digitaria horizontalis*. More work should be carried out to find out if these plant species flower and produce seeds at the same time or not.

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