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Research Article

Diversity of Cultivated Chamomile (*Matricaria Chamomilla* L.) Populations in Different Areas in Albania

Ndriçim Zhuri*

Plant Production Department, Agricultural University of Tirana, Tirana, Albania

***Corresponding Author:** Ndriçim Zhuri, Plant Production Department, Agricultural University of Tirana, Tirana, Albania.

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Abstract

Study for the assessment of the diversity of 9 chamomiles (*Matricaria chamomilla* L.) populations, surveyed and collected in nine districts of Albania (Lezha, Kruja, Berat, Fier, Skrapar, Tirana, Lushnja, Kucova and Korca), using morphological markers was carried out in the, Experimental field of Agricultural University of Tirana, during two growing seasons. The 10 chamomile populations, grown in a randomized block with three replications, were assessed by some morphological quantitative characters [10,11], (plant height, number of principal branches, length of internodes per plants) ANOVA and cluster analysis reveal presence of significant diversity, and the association among different morphological characters. Relationships between the morphological character's plant height and length of internodes per plants based on probability in the same point all average of plant height and length of internodes per plants are in correlation with each other. Correlation relationships among morphological quantitative characters range under 1. The study identifies the relation between plant height and length of internodes per plants as characters with agronomic interest which account for genetic diversity improvement of chamomile populations.

Keywords: Chamomile; *M. Chamomilla* Genotypes; Quantitative Characters; ANOVA.

Introduction

Chamomile plant is considered indigenous to northern Europe and grows wild in central. European countries; it is especially abundant in Eastern Europe including Albania. Chamomile is also found in western Asia, the Mediterranean region of northern Africa, and the United States of America. It is cultivated in many countries recently and many countries are working in this direction for the good cultivation practices of these medicinal plants [1-3].

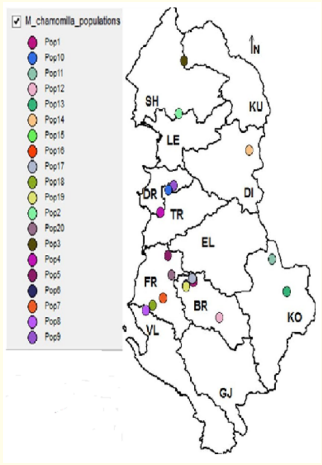
The aim of the study was the analysis of *Matricaria chamomilla* L., (morphological view) populations cultivated in different areas of Albania, and identification of the most important morphological characters, to be used in breeding programs of chamomile germplasm [10,11].

Material and Methods

Plant material was performed on nine 9 chamomile (*Matricaria chamomille* L.) populations, originated from nine collecting areas of Albania (Berat, Fier, Skrapar, Tirana, Lezha, Lushnja, Korca, Kucova and Kruja). Map 1. Morphological characters: Plant height (PH) (cm), Number of branches per plant (No.br), length of internodes (L.Int). This experiment was carried out using ANOVA analyses.

(Berat, Fier, Skrapar, Tirana, Lezha, Lushnja, Korca, Kucova and Kruja).

Sites in Albania are selected in order to survey the plant cultivation method in different sites in different climate, geomorphology, sea level above, and so on [10,11].



Map 1: Collecting areas in Albania.

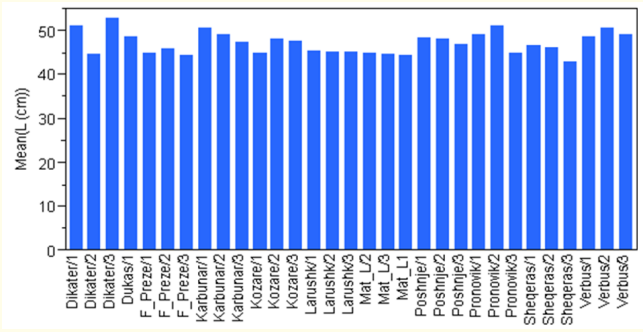
The geographic areas separated into grid cells of 1 km. the measurements of diversity and geographic distribution were analyzed in other paper. Present focus have been in the agronomic content the relation between: Plant height (PH) (cm), Number of branches per plant (No.br), length of internodes (L.Int).

Results and Discussion

The analysis of the vegetative growth index in length is reflected through test (F) and through comparison of the actual F-value with the theoretical F-values. The values of F-factors are derived from the ratio of the value of the dispersion of variants with the value of the dispersion of the error and in the case of length analysis has resulted greater than the value of F-theoretical which mean that is the truth of secure data.

The F-factorial values and the corresponding F-theoretical values are reflected for the probability level of truth (P-0.01). 0.57/03648.

The average of plant height of all analyzed values is 47.2 cm graph 1. clearly chamomile in 8 places of cultivation had an average plant height of 47.2 cm, which represents the different respective values of each country. This value is reliable and its limits below and above the average of each value constitute the maximum reliability p = 005, and the values outside them are excluded from the logic of the analysis.



Graph 1: Plant height, measured in different sites.

The shoots or branches hold the leaves according to the plant morphology. These are the specialized organ for the process of photosynthesis. Thin twigs hold the leaves installed at their nodes. In the sequence of different leaves are found apical buds which continuously differentiate new leaves.

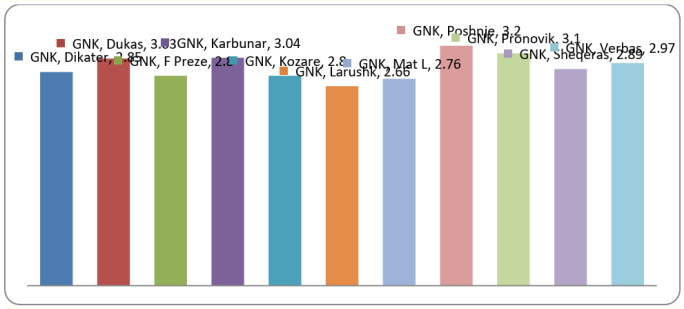
The leaves are installed on the branches or shoots that differentiate from the root neck. The shoots emerge from the neck of the root and have different development. 1 to 2 jumps have greater or equal weight while others have shorter lengths. The jumps are differentiated at an alternately time.

Measurements represented by the variables of the number of main branches in plants have determined the distribution position for each study site; the most accurate analysis was the arithmetic mean through the sum of all variables. In general, the average represented the reality of this quantitative feature. In the following, for the analysis of the distribution of variables, 10 cultivation sites were analyzed in this experiment, cities like Kuçova, Korçë, have resulted in equal averages, but in fact differ radically between them.

This statistic is based on two measurement values and consequently has given a rough estimate of the distribution.

Deviation (deviation) of each observation from the average number of jumps determined by; y = Y-Ȳ, resulted in 1.64. the deviation of the averages was different from the deviation of the repetitions. The mean deviation (DM) was the sum of all deviations over the number of each sample. The sum of mfy = 0, on average, has been very important in our analysis.

The coefficient of variation was different with the relative amounts of variation between 10 countries with different averages. The ratio of the standard deviation to the mean has compared the variation between the averages of the number of jumps between the countries, regardless of the size of the averages of their repetitions. Number of branches per plant (No.br), has had different averages and a coefficient of variation of 44.5%, quite high.



Graph 2: Number of branches per plant (No.br).

The level of avoidance caused by environmental elements, such as; absolute temperature, low temperatures, effective temperatures, solar radiation, etc. have had strong and varied effects on the biological indices of growth in the plant height and number of branches per plant [11].

Morphological plasticity's establish a change in phenotype associated with this genotype that we have studied in 10 different countries in response to different environmental conditions. These changes inevitably come from the action of the environment which gives the best assessment of the potential for phenotypic plasticity and are classically formulated in this way.

$$\sum V_A = V_{EG} + V_G \times A + V_{AS}$$

In these circumstances, of climate change, we have found the greatest plasticity in the repetition Pronovik/2 against Larushk/3 of 1.05 cm, followed by pronovik/2 - Dikater/2 by 1.02 cm and Pronovik/2 - Kozare/3 with 0.99 cm.

The amplitude of distribution and variation is R = 0.54 cm.

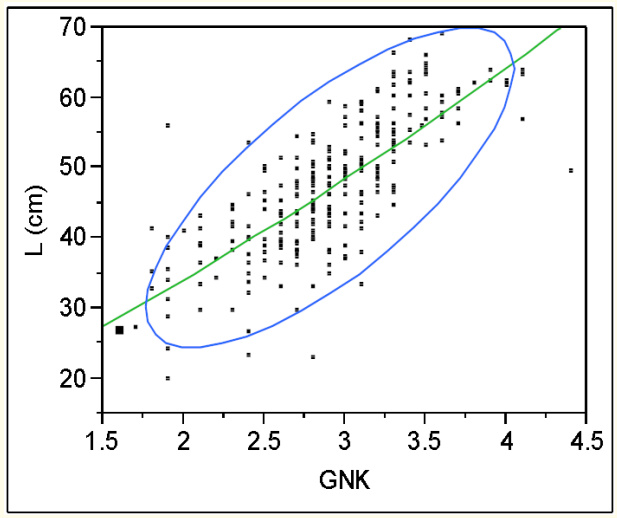
The level of variation in the case of the analysis of the means of the variants is cv = 13.7%, while in the judgment of the means of repetitions of the repetitions of each variant has resulted coefficient of variation 12.4% or a difference of 1.3% which is a consequence of reduction from the analysis of many variables sit illogical [7].

Anyhow we have analyzed a correlation between plant height and length of internodes per plant.

The comparison and distances between iterations when analyzing the relationships between node length and plant length is logical because referring to prob > F and prob > | t |, the actual value F is confirmatory for this correlation.

Polynomial Fit Degree = 2 L (cm) = 3.5084227 + 14.989098 * GNK + 0.7529698 * (GNK-2.90507) ^ 2. This is because at intercept point 3.50 all the mean growths of the plant and the length of internode are correlated.

In the summary analysis of the morphological indicator of the plant height and length of internodes per plant in terms of average values take the ranking (Poshnje > Pronovik > Karbunar > Dukas > Verbas > Larushk. In these circumstances the average distance has fluctuated between 3.2 cm to 2.66 cm, i.e., a variability of 0.54 cm.



Graph 3: The polynomial analysis.

The comparison and distances between iterations when analyzing the relationships between node length and plant length is logi-

cal because referring to prob > F and prob > | t |, the actual value F is confirmatory for this correlation.

Polynomial Fit Degree = 2 L (cm) = 3.5084227 + 14.989098 * L.Int + 0.7529698 * (L.Int-2.90507) ^ 2

This is because at intercept point 3.50 all the mean growths of the plant and the node are correlated and walk interdependently.

In the summary analysis of the morphological indicator of the length of the node, it has been confirmed that the analysis of the squares of the means of the groups expresses proven differences, which proves that the length of the main nodes has walked simultaneously with the length of the chamomile plant.

GNK growth averages in terms of average values take the ranking (Poshnje > Pronovik > Karbunar > Dukas > Verbas > Larushk. In these circumstances the average distance has fluctuated between 3.2 cm to 2.66 cm, with a variability of 0.54 cm.

The polynomial analysis presented in Graph 3, reflects the relationships between the plant height Lcm (X) and the length of internodes (L.Int). subunit (Y), simultaneously; ratios and their functional probability.

Recommendation

This research could help farmers to cultivate *M. chamomilla* L., and to protect this plant for generating income. Nowadays it is used not only as herbal drink but also in cosmetic, industry etc. During the cultivation and planting plants we suggest authorities to undertaken the necessary measures for the irrigation system that in almost all places need to be controlled. Cultivation of the medicinal plants and moreover of *M. chamomilla* L., should be in the focus of the strategic plans in the near future.

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