

STUDY ABOUT BIODIVERSITY OF MATRICARIA INODORA LIGULAE FLOWERS TYPE

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Abstract

The presence of scentless chamomile - Matricaria inodora (Matin-Bayer code) in cultivated fields, can result of agricultural practices and adapt it to the potential of that environment. On the podzolic soils of the South part, the weed is perfectly adapted like an invasive species. In dense crops such as: forage grasses, winter barley, winter wheat and fallow land on, weeds vegetate well, proving the potential for competition known and in highlighting the influence of morphology, possible as a result of growing (or not) of these agricultural lands. Biodiversity studies have been performed on numerous capitula and marginal - type flowers namely ligulae, which were analyzed the number and length of their petals. The data obtained showed that the number of flowers had type ligulae maximum frequency depending on the culture: 45/Lolium, 80/barley, 43/wheat and 90/uncultivated land (fallow). Modal value revealed 21 ligulae flowers. The length of the flowers to group around 1.0 cm, to a maximum of 80/Lolium, 60/barley, wheat and fallow land. Both determinations expressed specific asymmetric histograms. Flowers of the type ligulae revealed that the shape of botanical long-petal represented between 4.0 %/wheat and 11.5%/Lolium, from of all scentless chamomile analyzed.

Key words: biodiversity, crops, ligulae type flowers, long-petal form.

INTRODUCTION

Weeds, among which scentless chamomile-*Matricaria inodora* L., belong together in a dynamic agricultural system [1]. Develop and use measures were strong influencing factors in the management of all species of weeds. In today's conditions, the management calls for proper application of control measures by which to reduce as much competition with crops [3]. Thus, there is no need to eradicate all weeds, or their destruction before the disappearance, but to reduce their vigour to the point that ensure perpetuation of the species. Of all the existing weeds, *Matricaria* resisted and still resist to the farmer intervention by adjusting most apparent in dense crops such as: herbs and winter cereals [5]. The study of biology and morphology in particular can give some information for the application of management and the evolution of characters in response to the adaptation that

occurs over time [6]. Some studies refer to the plant characteristics, including biodiversity highlight [4, 7]. Maintain and possibly increase plant biodiversity, including all weeds, are obvious and necessary character of the sustainability of agricultural land. Biodiversity of scentless chamomile is best by ecotypes study [2] results in the history of agricultural cultivation of land and its adaptation to the geographical ecology. Ecotypical characters of weeds can be found and studied from the root to the top of the plant. In the present study were chosen ligulae flowers from the edge of capitula and were determined two of them: the number of petals, with medium length. Data demonstrate specific deviation from the mean values of determinations, with some specific features of agriculture from podzolic soils, Argeș area.

MATERIAL AND METHOD

In order to determine the number and type of flowers ligulae length, dense populations of scentless chamomile were chosen [8], which are in a phase of mass flowering, from Argeş county agricultural area (Photo 1).



Photo 1. *Matricaria inodora* flowering plant from winter wheat

Choosing ecotypes. Each selected population had a high degree of infestation: high density of without control measure surface. Were investigated by four sole of eco-systems: Ryegrass (*Lolium multiflorum*), winter barley, winter wheat and sole fallow.

Sampling. Infested area was covered with chamomile in zig-zag on a diagonal length of sole, without trying to choose a particular plant, special weed plant. Parking was one every 2 steps, which was measured by capitula: the number of ligulae flowers and their average length. Each plant selected for measurement was intended to be well educated and many flowers. Mainly surrendered to the top of the inflorescence. The procedures were repeated 50 times for each field examines. A total of 200 capitula were measured for each crop/ field.

Capitula analyses. Selected heads were analyzed and recorded the number of petals found, together with their average length. The data obtained were elaborated histograms for the four agricultural ecosystems: *Lolium multiflorum*, winter barley, winter wheat and fallow sols. In order observation of correlations between the two characters: the length and number of ligulae petals of chamomile, these correlations were developed. A table summarizes the variability of different flowers of *Matricaria* habitats

highlights the two characters mean, variance, standard deviation and coefficient of variation. Length variability in the data analysis ligulae flowers was observed that some refer to as botanical proportions long-petal.

RESULTS AND DISCUSSIONS

Analysis of the species flower *Matricaria* ligulae type showed specific variations, regardless of the eco-system analysis (Photo 2).



Photo 2. The weed capitula general aspect

Variability type number ligulae flowers. Of all measurements performed: 200 for each type of ecosystem, it was observed that the number of flowers petals ligulae type (Photo 3) were registered between 12-27 pieces.

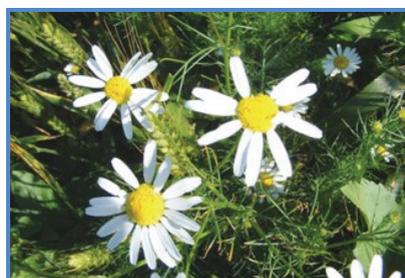


Photo 3. Low number of flowers petals ligulae type

How varied the number of petals and their frequency in the 4 types of ecosystems, revealed very different cases (Fig. 1). Thus, the eco-system of the species *Lolium multiflorum*, the histogram shows a maximum of 45 of 21 flowers capitula ligulae type. Distribution to the other frequencies (the module), has been progressively fewer petals and sharply higher numbers of petals.

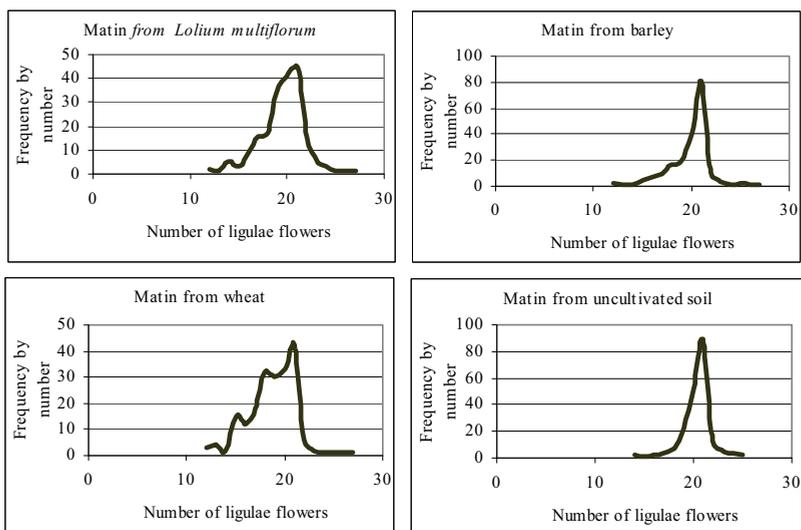


Fig. 1. Variability of *Matricaria inodora* ligulae flowers number from agroecosystems

Scentless chamomile in winter barley had a maximum frequency of 81 capitula with 21 flowers/capitula. Other values of the petals have been formed between 12 and 21 successively ascending and descending flowers at large numbers. The maximum winter wheat (modal value) was 42 capitula with 21 petals. In the section with fewer petals/capitula, number of pieces have followed an increase in scale, while heads with petals have fallen more sharply (Photo 4).



Photo 4. The weed encroachment level from wheat

Eco-fallow system (agricultural fallow) shows modal value of about 90 pieces, all at 21 ligulae/ capitula. Heads with fewer parts, and

with more pieces were relatively few, and the chart looks like a bell (the Gauss bell), approximately symmetrical. Research highlights the variability in the number of petals around the most represented: 21 petals/capitula.

Length variability ligulae type flowers. Compared with the number of petals of bad chamomile ligulae dimensions expressed by the length of petals known variations (Photo 5) of totally different (Fig. 2).

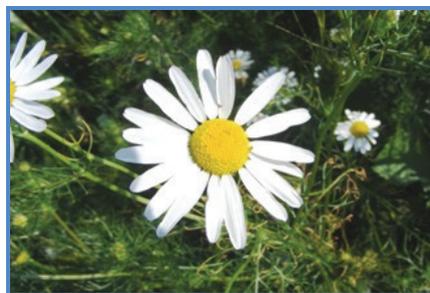


Photo 5. *Matricaria inodora* capitula with semi-long ligulae type flowers

Bad chamomile from annual ryegrass had the highest frequency, 79 petals, 1.0 cm long. Heads with petals shorter than 1.0 cm have evolved faster in comparison to the longest. In winter barley crop module shows a maximum of 60 capitula by 1.0 cm in length. Heads with shorter petals had a secondary maximum of

0.8 cm length, after which the size decreased a little. Petals to 1.0 cm longer than the frequency gradually decreased. Winter wheat had a module of the frequency of 65 capitula, whose length was 1.0 cm. Petals shorter area

followed the same distribution as barley, while the petals longer have decreased numbers faster. Chamomile petals with the sole cultivated looks capitula module 60, to 1.0 cm long.

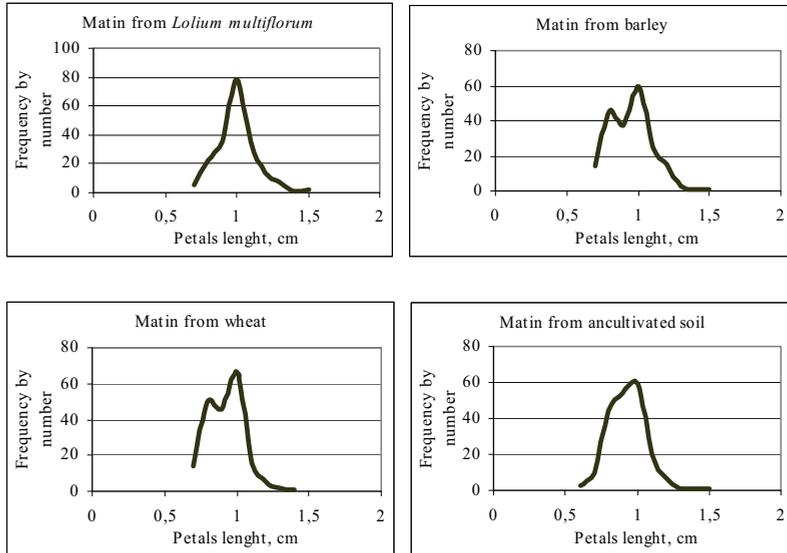


Fig. 2. Variability of *Matricaria inodora* flower petals length from agroecosystems

Petals with lengths of 0.8 cm and 0.9 cm approached the numerical modal frequency. Research highlights the variability of length petals to best demonstrated value: 1.0 c,m.

Correlations between length and number of petals, ligulae type. To further characterize the biodiversity of the chamomile flowers ligulae type, it is also possible to correlate the two characters: the number and length of these flowers. When considering the correlations of barley and wheat crops, will find different situations (Fig. 3). Bad chamomile positioning barley shows a regression line to about 19 ligulae flowers type, depending on the length of petals, falls at a constant rate of -0.2744 flower petals each length graduation. Wheat weed regression positioned right about 19-20

ligulae flowers, petals grow to that length with a constant rate of +0,6576 flower petals each length graduation.

Other aspects of biodiversity ligulae type of flowers. For a better characterization of the investigations, they have an important statistical index of variability. Data refer to the average of two determinations, variance, standard deviation (error) and coefficient of variation (Table 1). Values have sensitive oscillations.

Measured by length of lingual type flowers, could separate data from botanical species: long-petal. If considered as belonging to 1.0 cm length over this form, then the proportion of habitats obtained ranged from 4.0% (wheat) and 11.5% (*Lolium multiflorum*) (Table 2).

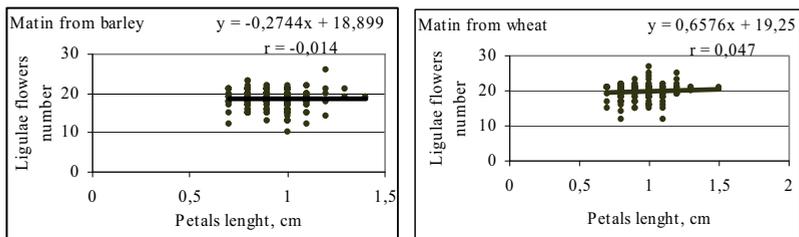


Fig. 3. Correlations between *Matricaria inodora* petals length and ligulae flowers number from barley and wheat eco-systems

Table 1 . Synthetic indices of *Matricaria inodora*'s ligulae flowers variability from agroecosystems

| Indices | <i>Lolium</i> | Barley | Wheat | Ancultivated |
|------------------------|---------------|--------|--------|--------------|
| Ligulae length, cm | | | | |
| Media, \bar{a} | 1.00 | 0.95 | 0.924 | 0.931 |
| Variance, s^2 | 0.0189 | 0.0216 | 0.0164 | 0.0186 |
| Standard deviation, s | 0.1375 | 0.1470 | 0.1281 | 0.1365 |
| Coef. of variation, s% | 13.77 | 15.47 | 13.90 | 14.70 |
| Ligulae flowers number | | | | |
| Media, \bar{a} | 19.44 | 19.88 | 18.66 | 20.45 |
| Variance, s^2 | 5.336 | 4.230 | 5.554 | 2.218 |
| Standard deviation, s | 2.310 | 2.057 | 2.357 | 1.489 |
| Coef. of variation, s% | 11.86 | 10.30 | 12.60 | 7.30 |

Table 2. Proportion of *Matricaria inodora* long-petal form from agroecosystems

| Eco-system | <i>Matricaria inodora</i> , long-petal form, % |
|---------------------------|--|
| <i>Lolium multiflorum</i> | 11.5 |
| Winter barley | 9.5 |
| Winter wheat | 4.0 |
| Ancultivated | 5.0 |

CONCLUSIONS

Number of petals and their length ligulae type showed variability depending on eco-systems researchers: values ranged around 21 ligulae flowers/capitula, with their average length of 1.0 cm (Photo 5).



Photo 5. The *Matricaria inodora* weed with medium ligulae type characteristics

The correlations obtained between the two characters show different situations: the negative trend of the culture of barley and the positive for wheat.

The proportion of habitats form long-petals investigated ranged between 4.0% (wheat) and 11,5% (from *Lolium multiflorum*).

Research of this type could become important in the study of variability of weeds in crops development, including the species *Matricaria inodora*.

Ecotypes researchers have demonstrated a specificity expressed zonal farming systems practiced in the South podzolic soil.

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