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THE SPREAD OF THE INVASIVE SPECIES *AMBROSIA ARTEMISIIFOLIA* L. IN ROMANIA, BETWEEN 2005-2007

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Abstract: *Ambrosia artemisiifolia* L. is an anual seed producing herbacee plant (terophite), with a late germination , identified in the North-West , West, South and Centre of Romania, but also in some locations in the East. As a result of the invasive character of the species and of the spreading along the communications ways, the *Ambrosia artemisiifolia* L species has extended from the West and North-West towards the Centre and the South of Romania and continues to extend to the East and North-East. This study presents the evolution of the *Ambrosia artemisiifolia* L.species spread in Romania, for the time period between 2005-2007.

INTRODUCTION

The species of plants that belong to the *Ambrosia* type, are kown as the most nocive plants in the world, due to allergies that they induce (RICH 1994).

The *Ambrosia artemisiifolia* L.species is an invasive and allergene weed, that was included in Romanian official quarantine list of weeds, also in many other states, as is presented by: Gh. Ionescu-Şişeşti (1955); I. Popescu and colab. (1969); Gh. Anghel and colab. (1972) (HODIŞAN 2007).

The polen produced by this species, in the blooming period (August-September), has a high potential of causing allergies, known as „hay fever" and astmatic reactions (BOHREN şi colab. 2006).

TARAMARCAZ and colab. (2005) outline that about 10% of population is sensitive to the *Ambrosia artemisiifolia* L. pollen species and almost a quarter of this population can manifest astmatic reactions, as experiments carreid out in Europe and North America demonstrated.

In Europe, according to Hegi writtings (1906), the species was identified for the first time in 1863 in Germany, in the areal of the Brandenburg and Pfaffendorf lands. It was still there to be studied, since 1865. It was signaled in other areas of Central Europe. Here it didn't spread within the spontaneous flora because of its reduced acclimation capacity, the wet and cold climate from the mentioned areas would not permit the seeds maturation (BÉRES 1981, BÉRES and colab. 2006).

The period of the First World War is described as being more favorable in the spreading and multiplication of the *A. artemisiifolia* L. species in Europe, but one explosive massive spread was produced in the Second World War, when there were identified two epicentres, one surrounding the city of Lyon, in France, and the second one in Croatia, near the border with Hungary (SZIGETVARI and BENKO 2004).

TOTH and colab. (2004) affirm that in 1986, in Hungary, over 380 thousands of hectares were invadaded by *Ambrosia artemisiifolia* L. and in 2003, the species was identified in 5,4 million hectares, with a massive invasion in 700 thousands hectares out of total.

During the 60's and 70's, its presence became a real problem for the public health in France where approximately 100.000 people were affected in the Rhone – Alpes region, (LAMBELET 2005).

Dickerson and Sweet (1971) shows that *Ambrosia artemisiifolia* L. is the most spreaded, from the type species in Great Britain, this being considered a species with a large variability with different ecotypes (RICH 1994).

Presence of the *Ambrosia artemisiifolia* L. species was also signaled in Switzerland at the end of the 19th, but a massive spread of the species was stopped in the moment that the conditions permitted the species to expand gradually, today becoming a grave danger (BOHREN and colab. 2006).

On the territory of Romania, for the first time, *Ambrosia artemisiifolia* L. species was signaled in 1908, in the area of Banat, more precisely in Orşova, the area belonged to the Austro-Hungarian Empire at the time (according to: Jávorka (1910); Timar (1955); Anghel and colab. (1972); Béres and colab. (2006). Therewith it was signaled in the Cluj region, at Şodorît on the rubble of the flooded everglade of the Someş and on the shore of the Danube, after Flora Romaniae Exicata 1921-1947 (HODIŞAN şi MORAR 2008).

Later it was identified in other parts of Romania, in Moldova- to Ungheni region, after Borza and Arvat (1935), in Sighet area, after Topa Em. and Boşcaiu N. (1965), at Huşi and Bârlad, after Mititelu D. (1970) and in Muntenia la Ploieşti region, after Negrean G. (1971). Ardelean and Karácsony (2002), signal the presence of this species and in Western Field, on the Valley of Ier and Fărcăşescu and Laurer (2007) identify the species in many locations in Timiş county, situated in the West of the country (HODIŞAN 2007).

Recent desciptions signal the spread of the *Ambrosia artemisiifolia* L. species in Bihor county, in North – Western locations of the country, where it is growing in almost all types of soil and it is met until the altitude of 692 meters high. (HODIŞAN and colab. 2003; HODIŞAN and MORAR 2005).

MATERIAL AND METHOD

For the research of the spreading and expansion of the *Ambrosia artemisiifolia* L. species in Romania, there were taken as a research area al the 41 counties of the country and also the area of Bucharest.

The observations regarding the spread of this weed were carried out in the public areas of localities (parks, gardens, swimming places), but also in the limiting areas of the localities (agricultural holdings, forests), in industrial perimetres (sites, quarries), also along the communication paths (communal, county, national roads and railroads).

The determinations were made between 2005 – 2007 in the months of August and September, when the plants can easily be identified as singular individuals or gruped in compact populations.

It was traced the location of the areals on the map, called locations, which contain one or more populations of plants and which lately was noted in the surounding of the nearest locality. Therewith it was noted the number of individuals inside a population, also the phisiological state of development of the plants. There were made pictures and there were

writen down: type of soil, the form of relief and the altitude of the location where it was identified the presence of the species.

In accordance with the grouping of the locations there were made maps of the area.

RESULTS AND DISCUSSIONS

The research regarding the spread of the *Ambrosia artemisiifolia* L. species in Romania, was made in three stages (fig. 1).

In first stage, it was observed the spread of the species in the North – West and West counties of the country. The studies were carried out between 2005-2007, by orbserving 10 counties from this area respesctively Maramureş, Satu Mare, Bihor, Sălaj, Arad, Cluj, Alba, Hunedoara, Timiş şi Caraş Severin.

Figure 1. The spread of the *Ambrosia artemisiifolia* L. in Romania, between 2005 - 2007

Following the observations there were identified 91 locations in which *Ambrosia artemisiifolia* L. is spreaded:

In Maramureş county the species was signaled in the following locations: Seini, Cicârlâu, Tăuții-Măgherăuş, Ardusat, Săpânța, Sighetu Marmației.

In Satu Mare county in locations like: Andrid, Pişcolt, Sanislău, Berveni, Carei, Satu Mare, Botiz, Apa, Beltiug, Livada, Ardud, Tăşnad, Acâş, Oraşu Nou, Negreşti Oaş, Certeze.

In Sălaj county, in locations like: Sărmăşag, Pericei, Zalău, Bocşa, Hereclean.

In Bihor county, in locations like: Curtuişeni, Şimian, Valea lui Mihai, Tarcea, Sălacea, Săcuieni, Diosig, Marghita, Sălard, Suplacul de Barcău, Oradea, Biharia, Sântandrei, Sânmartin, Oşorhei, Cefa, Salonta, Aleşd, Borod, Tinca, Beiuş, Vaşcău, Lăzureni.

In Cluj county, in locations like: Bucea, Poieni, Huedin, Apahida.

In Arad county, in locations like: Vinga, Pecica, Zădăreni, Ghioroc, Arad.

In Timiş county, in locations like: Beba Veche, Periam, Sânicolaul Mare, Jimbolia, Timişoara, Lugoj, Deta, Şag, Jebel, Teremia Mare, Recaş, Topolovățu Mare, Coşteiu, Moravița, Berecsău Mare, Sacalaz, Buziaş.

In Caraş Severin county, in locations like: Caransebeş, Băile Herculane, Domaşnea, Buchin, Sacu, Prisaca, Lăpuşnicel, Armeniş.

In county, in locations like: Ocna Mureş, Aiud, Alba Iulia, Sebeş.

In Hunedoara county, in locations like: Deva, Simeria, Hunedoara.

The second stage, was carried out between 2006 – 2007. The studies were done in the counties of Gorj, Mehedinți, Dolj, Olt, Vâlcea, Teleorman, Argeş, Dâmbovița, Ilfov, Călăraşi, Ialomița, Prahova, Giurgiu, Buzău, Brăila, Tulcea and Constanța.

In acording with the observations within the 17 counties there were identified 78 locations in which the common ragweed (*Ambrosia artemisiifolia* L.) is spreaded.

In Gorj county in locations like: Târgu-Jiu, Bumbeşti-Jiu, Motru, Bengeşti, Târgu Cărbuneşti

In Olt county in locations like: Ianca, Corabia, Balş, Drăgăneşti Olt, Caracal, Brâncoveni, Piatra Olt.

In Mehedinți county in locations like: Drobeta Turnu-Severin, Orşova, Ilovița, Căzăneşti, Malovăț, Punghina, Vânju Mare, Şimian, Fața Cermenii, Strehaia, Butoieşti, Vânători, Salcia.

In Dolj county in locations like: Filiaşi, Brădeşti, Craiova, Cetate, Calafat, Poiana Mare, Băileşti, Segarcea, Bistreț, Măceşu de Jos, Plosca, Ostroveni, Bechet, Dăbuleni.

In Vâlcea county in locations like: Prund, Bujoreni, Băile Govora.

In Teleorman county in locations like: Roşiori de Vede.

In Argeş county in locations like: Piteşti, Drăganu Olteni.

In Dâmbovița county in locations like: Găieşti, Titu, Brezoaele.

In Ilfov county in locations like: Ciolpani, Tunari, Brăneşti, Bragadiru, Buftea, Jilava, Chitila, Pantelimon, Berceni, Glina, Otopeni, Cernica.

In Călăraşi county in locations like: Fundulea, Lehliu Gară, Dragalina, Perişoru.

In Ialomița county in locations like: Feteşti, Țăndărei, Slobozia, Andrăşeşti, Balaciu, Urziceni, Armăşeşti.

In Prahova county in locations like: Albeşti Paleologu, Ploieşti, Băicoi, Câmpina, Breaza, Comarnic, Gorgota.

In counties of Giurgiu, Buzău, Brăila, Tulcea şi Constanța there wasn't signaled any presence of the common ragweed.

The third stage of study of the spread and expansion of the *Ambrosia artemisiifolia* L. species was carried out in 2007 in the Centre and North – East of the country and as study area there chosen the terrories of the following counties : Bistrița Năsăud, Mureş, Sibiu, Harghita, Braşov, Covasna, Vrancea, Galați, Bacău, Vaslui, Neamț, Iaşi, Botoşani and Suceava.

In acording with the observations within the 14 counties there were identified 13 locations in which the common ragweed (*Ambrosia artemisiifolia* L.) is spreaded.

The presence of the species was signaled in Sibiu county at Sălişte and in Bacău county at Buhuşi, in Braşov county at Braşov and Predeal and in Vrancea county at Adjud and Mărăşeşti. In Galați county at Galați, Braniştea and Tudor Vladimirescu and in Vaslui county at Bârlad, Huşi, Vaslui and Negreşti.

In the counties of: Bistrița Năsăud, Mureş, Harghita, Covasna, Iaşi, Botoşani, Piatra Neamț şi Suceava, in the period of the studies, *Ambrosia artemisiifolia* L. species was not identified.

In this area the species doesn't form populations, the only signal of its presence is given by a few individuals.

The phisiological development phase of the common ragweed plants from this area, responded according to the calendar of the north – western, western and southern plants of the country, which confirms the fact that this species is able to produce seeds in an efficient number as to grow up as local populations.

CONCLUSIONS

According to the studies regarding the spread of the *Ambrosia artemisiifolia* L. species it was noticed that this is an invasive species spreaded on considerable surfaces in the North-West, West and South of Romania. The Centre, East and Nord-East of the country represent an area in which the species is not spreaded, an exception being a few locations where was identified the presence of several individuals which were in a phisiological development stage much similar to that of the common ragweed plants from the locations where the species is largely spreaded.

After the division into zones of the location in accordance with the number of individuals that compose the populations, a map was conceived (figure 2), in which is showed the area of spreading of the *Ambrosia artemisiifolia* L. species in Romania, between 2005-2007, as:

- **area I**, represents those locations in which the species has over 100 individuals grouped in populations, which can cover more dozens of squaremeters;
- **area II**, represents those locations in which the species has less than 10 individuals grouped in populations and the surface which they cover it's only a few squaremeters;

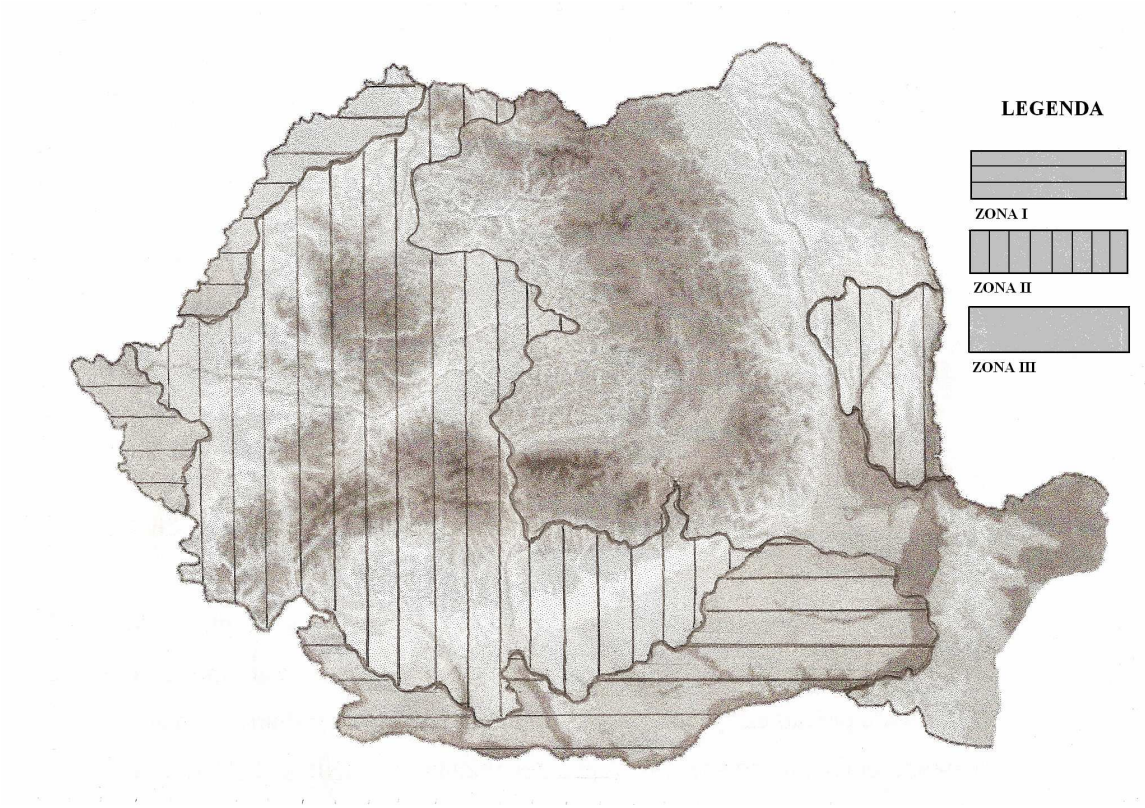

Figure 2. The division into zones of the spreading of the *Ambrosia artemisiifolia* L.species in Romania, between 2005-2007

- area III, represents the free zone, where it wasn't signaled the presence of the species, but it doesn't exclude the possibility of an emergence of some individuals in this area, due to the dissemination insured by the animals and the birds that crosses the area or with the occasion of product transports from the infected areas.

The presence of the species generalized in the period of our study was signaled in localities, in gardens around the households, in the recreation areas, also in the industrial areas, but mostly outside localities in the agricultural areas or moors, with high degree of dominance and a growth rate intensification.

Ambrosia artemisiifolia L. species develops almost on any type of soil, its presence was pointed out even at the altitude of 692 m high.

The waysides constitute a zone in which the species is frequentlty met, because of a systematic dissemination with seeds, favored by transports which cross the territories where the species adapted, forming and installing populations; following that it moves to the agricultural cultures as a terophyte, annual weed, with a in late germination.

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