

THE GALLS FROM TINCA AREA (BIHOR COUNTY, ROMANIA)

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Abstract: The study presents some the species which induce galls, identified in the Tinca area during 2003 - 2009. These species (72) belongs to different taxonomic groups: insects, acari, fungus. We are mentioned for the first time in Crișana province four species: *Eriophyes canestrinii* Nal, *Dasyneura ruebsaameni* Kffr, *Euribia cardui* L and *Cryptomyzus ribis* L.

Keywords: galls, Tinca, gall-inducing species.

INTRODUCTION

Tinca area (Figure 1) is located in the southwestern part of Bihor County, belonging to the historical province Crișana, with a surface of 454 km², at the confluence of

the Miersigului Plain and the Holodului Depression. The middle altitude is 100-150 m, the climate is temperate-continental, moderate and the drainage is represented by Crișul Negru River.



Fig. 1 Location of Tinca area in Bihor County, Romania (Source: own compilation by Google Earth software)

Galls are considered those abnormal outgrowths of plant tissues caused or induced by various vegetal or animal parasite sources.

Galls are developed in a certain organ of the plant and in a certain period of time, representing a defense reaction of the attacked plant.

One part from the attacked plants belongs to the agricultural cultures or woody essences, so in certain periods of vegetation can produce important economic damages.

MATERIAL AND METHODS

The collecting of galls was effectuated during 2003-2009, in the period April-October, in different ecosystems from Tinca area: oak forest, beech forest, forest mixture of different deciduous tree, pastures with *Gramineae* (*Poaceae*) and other plants, the waterside of Crișul Negru River.

The galls were collected into plastic bags, together with one part from the attacked organ of the plant.

After the identification of the gall-inducing species, of the host plant and of the attacked organ and the collecting data were written down. The determinations

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were realized after the galls and /or gall-inducing insect species.

The researches referring to galls from the mentioned area have never been effectuated till present.

RESULTS AND DISCUSSIONS

Following the researches effectuated in the Tinca area in the analyzed period, a number of 72 gall-inducing

species was identified. These species belong both to the vegetable and animal kingdom: mites (Acari), insects, fungus.

The distribution and the systematic framing are presented in the Table 1:

Table 1	
The distribution and the systematic frame of gall-inductors from Tinca area	
Gall-inductors	Orders, Classes
Acari	<i>Eriophyidae</i>
Insects	<i>Homoptera</i> (<i>Aphididae</i> , <i>Pemphigidae</i>)
	<i>Hymenoptera</i> (<i>Cynipidae</i> , <i>Tenthredinidae</i>)
	<i>Coleoptera</i> (<i>Curculionidae</i>)
	<i>Diptera</i> (<i>Cecidomyiidae</i> , <i>Tephritidae</i>)
Fungus	<i>Ascomycetae</i> , <i>Erysiphaceae</i> , <i>Peronosporaceae</i> , <i>Hypocreaceae</i>

The list of the galigene species from the Tinca area:

- *Aceria macrochela* (NALEPA 1891) (Eriophyidae) – on the lamina of *Acer* (LINNAEUS 1758).
- *Dasyneura tympani* (KIEFFER 1909) (Cecidomyiidae) – on the lamina of *Acer campestre* (LINNAEUS 1763).
- *Dasyneura aceracrispans* var. *rubella* (KIEFFER 1909) (Cecidomyiidae) – on the young lamina of *Acer* sp.
- *Rhopalomyia ptarmicae* (VALLOT. 1849) (Cecidomyiidae) – on the inflorescences of *Achillea* (LINNAEUS 1763).
- *Aceria (Eriophyes) brevitarsa brevitarsa* (FOCKEU. 1890) (Eriophyidae) - on the lamina of *Alnus* (MILLER 1823).
- *Dasyneura alni* (LOW. 1877) (Cecidomyiidae) - on the lamina of *Alnus* (MILLER 1823).
- *Stefaniella ceconii* (KIEFFER 1909) (Cecidomyiidae) - on the inflorescences of *Atriplex patula* (LINNAEUS 1763).
- *Eriophyes canestrinii* (NALEPA 1891) (Eriophyidae) - on the lamina of *Buxus sempervirens* (LINNAEUS 1783).
- *Monarthropalpus buxi* (GEOFFROY 1950) (Cecidomyiidae) - on the lamina of *Buxus sempervirens* L.
- *Dasyneura ruebsaameni* (KIEFFER 1909) (Cecidomyiidae) - on the lamina of *Carpinus betulus* (LINNAEUS 1763).
- *Euribia (Tephritis) cardui* (LINNAEUS 1758) (Tephritidae) - on the stem of *Cirsium* (MILLER 1823).
- *Craneiobia corni* (GIRAUD 1863) (Cecidomyiidae) - on the lamina of *Cornus* (LINNAEUS 1763).
- *Contarinia corylina* (LOW. 1878) (Cecidomyiidae) - on the amentum of *Corylus* (LINNAEUS 1746).
- *Dasyneura crataegi* (WINN. 1853) (Cecidomyiidae) - the leafs of *Crataegus* (LINNAEUS 1746).
- *Hartigiola annulipes* (HARTIG 1839) (Cecidomyiidae) - on the lamina of *Fagus sylvatica* (LINNAEUS 1758).
- *Mikiola fagi* (HARTIG 1839) (Cecidomyiidae) - on the lamina of *Fagus sylvatica* L.
- *Dasyneura glechomae* (KIEFFER 1909) (Cecidomyiidae) - the leafs of copse of *Glechoma hederacea* (Linnaeus 1763).
- *Rondaniola bursaria* (BREMI 1847) (Cecidomyiidae) - on the lamina of *Glechoma hederacea* L.
- *Pseudoperonospora humuli* (WILSON 1914) (Peronosporaceae) - on the lamina of *Humulus lupulus* (Linnaeus 1758).
- *Aceria (Eriophyes) tristriata erinea* (NALEPA 1891) (Eriophyidae) - on the lamina of *Juglans regia* (Linnaeus 1723).
- *Dasyneura mali* (KIEFFER 1909) (Cecidomyiidae) - on the lamina of *Malus* (MILLER 1823).
- *Contarinia medicaginis* (KIEFFER 1909) (Cecidomyiidae) - on the floral bud of *Medicago sativa* (LINNAEUS 1758).

- *Ascomyces aureus* (MONTER & DESMOND 1863) (Ascomycetes) - on the lamina of *Populus* (LINNAEUS 1763).
- *Pemphigus bursarius* (LINNAEUS 1758) (Pemphigidae) - on the petiole of *Populus* L.
- *Pemphigus filaginis* (FONSECA 1857) (Pemphigidae) - on the petiole of *Populus* L.
- *Pemphigus spirothecae* (PASSERINI 1860) (Pemphigidae) - on the petiole of *Populus* L.
- *Albugo portulacae* (KUNTZE 1853) (Peronosporaceae) - on the lamina and the stems of *Portulaca* (LINNAEUS 1763).
- *Macrolabis rüesaaemni* (HEDICKE 1938) (Cecidomyiidae) – on the inflorescences of *Prunella* (LINNAEUS 1793).
- *Roepkea marchali* (BORNER 1931) (Homoptera) - the leaf of copse of *Prunus cerasifera* (ERHERBERT 1897).
- *Polystigma rubrum* (PERSON 1815) (Hypocreaceae) - on the lamina of *Prunus domestica* (LINNAEUS 1793).
- *Andricus caputmedusae* (HARTIG 1843) (Cynipidae) - the copse of *Quercus* (LINNAEUS 1763).
- *Andricus foecundatrix* (HARTIG 1843) (Cynipidae) - at the base of the petiole of *Quercus* L.
- *Andricus gallaetinctoriae* (OLIVIER 1791) (Cynipidae) - at the base of the petiole of *Quercus* L.
- *Andricus hungaricus* (HARTIG 1843) (Cynipidae) - on the buds of *Quercus* L.
- *Andricus kollari* (HARTIG 1843) (Cynipidae) - on the buds of *Quercus* L.
- *Biorhiza pallida* (OLIVIER 1791) (Cynipidae) - at the extremity of the branch of *Quercus* L.
- *Cynips divisa* (HARTIG 1843) (Cynipidae) - the nervures of the ventral part of the lamina of *Quercus* L.
- *Cynips quercus* (FOURCROY 1785) (Cynipidae) - the nervures of the ventral part of the lamina of *Quercus* L.
- *Cynips quercusfolii* (LINNAEUS 1758) (Cynipidae) - the nervures of the ventral part of the lamina of *Quercus* L.
- *Neuroterus numismalis* (OLIVIER 1791) (Cynipidae) - the ventral part of the lamina of *Quercus* L.
- *Neuroterus quercusbaccarum* (LINNAEUS 1758) (Cynipidae) - the ventral part of the lamina of *Quercus* L.
- *Synophrus politus* (HARTIG 1843) (Cynipidae) - the branches of *Quercus cerris* (LINNAEUS 1724).
- *Macrodiplosis dryobia* (LOW 1878) (Cecidomyiidae) - on the lamina of *Quercus* L.
- *Sphaerotheca pannosa* var. *rosae* (WOREL 1876) (Erysiphaceae) - on the lamina of *Rosa* (LINNAEUS 1724).
- *Blennocampa pusilla* (KLUG 1816) (Tenthredinidae) - on the lamina of *Rosa* L.
- *Diplolepis eglanteriae* (HARTIG 1843) (Cynipidae) - on the lamina of *Rosa* L.
- *Diplolepis rosae* (LINNAEUS 1758) (Cynipidae) - the branches, the lamina and fruits of *Rosa* L.
- *Wachtliella rosarum* (HARDY 1850) (Cecidomyiidae) - on the lamina of *Rosa* L.
- *Dasyneura plicatrix* (LOW 1878) (Cecidomyiidae) - on the lamina of *Rubus* (LINNAEUS 1769).
- *Lasyoptera rubi* (SCHRANK 1803) (Cecidomyiidae) - on the stems of *Rubus* L.
- *Pontania proxima* (SERVILLE 1823) (Tenthredinidae) - on the lamina of *Salix* (LINNAEUS 1796).
- *Pontania vesicator* (BREMI 1849) (Tenthredinidae) - on the lamina of *Salix* L.
- *Dorytomus taeniatus* (FABRICIUS 1781) (Curculionidae) - the inflorescence of *Salix* L.
- *Iteomyia capreae* (WINNERTZ 1853) (Cecidomyiidae) - on the lamina of *Salix* L.
- *Rhabdophaga (Helicomylia) saliciperda* (DUFOR 1841) (Cecidomyiidae) - the branches of *Salix* L.
- *Rhabdophaga terminalis* (LOW 1878) (Cecidomyiidae) - on the lamina of *Salix* L.
- *Cystiphora sonchi* (LOW 1878) (Cecidomyiidae) - on the lamina of *Sonchus* (LINNAEUS 1723).
- *Eriophyes exilis* (NALEPA 1891) (Eriophyidae) - on the lamina of *Tilia* (LINNAEUS 1746).
- *Eriophyes lateannulatus* (SCHULZE 1918) (Eriophyidae) - on the lamina of *Tilia* L.
- *Eriophyes leiosoma* (NALEPA 1891) (Eriophyidae) - on the lamina of *Tilia* L.
- *Didydomyia reaumuriana* (LOW 1878) (Cecidomyiidae) - on the lamina of *Tilia* L.
- *Dasyneura trifolii* (LOW 1878) (Cecidomyiidae) - on the lamina of *Trifolium* (LINNAEUS 1746).
- *Byrsocrypta (Tetraneura) ulmi* (Linnaeus 1758) (Aphididae) - on the lamina of *Ulmus* (Linnaeus 1763).
- *Janetiella lemei* (KIEFFER 1909) (Cecidomyiidae) – on the principal nervure of the lamina of *Ulmus* L.
- *Dasyneura urticae* (PERRIS 1840) (Cecidomyiidae) - the leaf, stems and flowers of *Urtica dioica* (LINNAEUS 1769).
- *Jaapiella veronicae* (VALLOT 1827) (Cecidomyiidae) - on the lamina of *Veronica chamaedrys* (LINNAEUS 1796).



- *Dasyneura viciae* (KIEFFER 1909) (Cecidomyiidae) - the leaf of the branches top of *Vicia* (LINNAEUS 1783).
- *Dasyneura affinis* (KIEFFER 1909) (Cecidomyiidae) - on the lamina of young leaf of *Viola odorata* (LINNAEUS 1786).
- *Eriophyes vitis* (PAGEN STECHER 1857) (Eriophyidae) - on the lamina of *Vitis* (LINNAEUS 1727).
- *Cryptomyzus ribis* (LINNAEUS 1758) (Aphididae) - on the lamina of *Ribes rubrum* (LINNAEUS 1723).
- *Rhabdophaga heterobia* (LOW 1878) (Cecidomyiidae) - on the lamina or the female amentum of *Salix L.*
- *Lasyoptera rubi* (SCHARANK 1849) (Cecidomyiidae) - the stem of *Rubus idaeus* (LINNE).

From the total of the 72 gall-inducing species, the family *Cecidomyiidae* is prevalent from the specific character point of view (32 species – 45.71 %), followed by *Cynipidae* (14 species – 20.00 %), *Eriophyidae* (8 species – 11.42%), *Pemphigidae* (3 species – 4.28 %), *Tenthredinidae* (3 species – 4.28 %), *Peronosporaceae* (2 species – 2.85 %), *Aphididae* (2 species – 2.85 %),

Tephritidae (1 species – 1.42 %), *Ascomycetes* (1 species – 1.42 %), *Hypocreaceae* (1 species – 1.42 %), *Erysiphaceae* (1 species – 1.42 %) and *Curculionidae* (1 species – 1.42 %).

The percentage ratio of the grops of gall-inducing organisms is the next: Acari -8 species (11.42 %), Insects - 57 species (81.42 %), Fungi - 5 species (7.14 %).

The percentage distribution of the orders of gall-inducing insects is the next: *Homoptera* - 6 species (10.52 %), *Hymenoptera* - 17 species (29.82 %), *Coleoptera* - 1 species (1.75 %), *Diptera* - 33 species (57.89 %).

Within the Fungi the percentage ratio is: *Ascomycetae* -1 species (20.00 %), *Erysiphaceae* - 1 species (20.00 %), *Peronosporaceae* - 2 species (40.00 %), *Hypocreaceae* -1 species (20.00 %).

We were realized too an ecological quantitative study about the galls from herbaceous layer from one lawn situated near by the Tinca village, having surface of 1 m². The galls collection were realized monthly (30 during one month) in the period 2006-2009, during May - October. The relief of this surface is plane, the insolation and the draughts are intense. The vegetation is made up by the following species: *Cirsium arvense* Scop., *Medicago sativa* L., *Urtica dioica* L., *Vicia grandiflora* Scop., *Poa pratensis* L., *Trifolium repens* L.

Table 2

The annual numerical density of galls from the herbaceous layer of one lawn from the Tinca village (2006-2009)				
Galigene species	The annual number of galls on species			
	2006	2007	2008	2009
<i>Euribia cardui</i> L.	2	-	3	1
<i>Contarinia medicaginis</i> Kffr.	4	2	3	2
<i>Dasyneura urticae</i> Perr.	76	80	100	60
<i>Dasyneura viciae</i> Kffr.	83	79	96	85
<i>Dasyneura trifolii</i> Low.	5	10	6	8

The species with the bigger number of galls are: *Dasyneura urticae* Perr., *Dasyneura viciae* Kffr., while *Euribia cardui* L. presents a reduced number of galls, during 2007 missing even completely (Table 2).

Distribution of galls on host-plants

From the total of the 5230 galls produced by 72 species and collected in the Tinca area in the period 2003-2010, were observed that the species attacks generally one single organ of the plant, where produces the gall.

However, the galls of *Rhabdophaga heterobia* H. Lw. produces generally galls on terminal leaf of the

branches of *Salix*, but could produces galls even on the female amentum. This distribution of the galls of *Rhabdophaga heterobia* H. Lw. was followed on one material of 420 galls.

At *Diplolepis rosae* L. (250 galls observed) the majority of the galls were observed on leaf and fruits and one percentage more small on branches.

From the total of 50 galls of *Dasyneura urticae* Perr., the majority were developed on leaf and floral peduncles and one small percentage on stem (Table 3).

Table 3				
The frequency of distribution of the galls of <i>Rhabdophaga heterobia</i>, <i>Diplolepis rosae</i> and <i>Dasyneura urticae</i> on different organs of the plants				
The material observed	The place of development of gall	Absolute frequency	Relative frequency	The percentage
<i>Rhabdophaga heterobia</i> 420 galls	Leafs	390	0,9285	92,85
	The female amentum	30	0,0714	7,14
<i>Diplolepis rosae</i> 250 galls	Leafs	86	0,344	34,40
	Fruits	135	0,54	54
	Branches	25	0,1	10
<i>Dasyneura urticae</i> 50 galls	Leafs	28	0,56	56
	The floral peduncles	20	0,4	40
	Stem	2	0,04	4

CONCLUSIONS

In the analyzed period, in the Tinca area, 72 gall-inducing species were identified, the biggest percentage being held by insects. The galls induces by these insects are studied as to their distribution on the host plant and their numerical density.

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