

Insects in relationships with *Asteraceae* plants

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Rezumat

Insecte în relații cu plante din familia *Asteraceae*

Pe baza materialului biologic colectat în perioada 1980-1995 din diferite regiuni ale țării, de la 75 specii de asteracee s-au obținut date importante despre insectele aflate în relații cu plantele acestei familii.

De pe plantele de asteracee am colectat 61 specii de insecte fitofage, entomofage și polenizatoare. Din organele acestor plante am obținut 74 specii de insecte monofage, oligofage și polifage din ordinele: *Thysanoptera* (2), *Homoptera* (2), *Heteroptera* (5), *Coleoptera* (11), *Lepidoptera* (23), *Hymenoptera* (1) și *Diptera* (30).

Unele dintre aceste insecte sunt dăunătoare culturilor agricole, iar altele joacă un rol semnificativ ca factori de combatere biologică a buruienilor.

Asteraceae family constitute a groups of plants, that, in their evolution, are placed on the superior level of development and occupy an important place as part of families of our country flora. From those 481 species, belonging to 91 genera, 105 species are cultivated, and the others are spontaneous. The most rich in species are the following genera: *Centaurea* (54), *Hieracium* (36), *Cirsium* (26), *Senecio* (24), *Achillea* (22), *Carduus* (20), *Artemisia* (15), *Crepis* (14), *Imula* (11), *Lactuca* (10), *Matricaria* (9), so an., (CIOCĂRLAN 1992). Among the spontaneous species there are many doubtful-weeds, particularly species of genera: *Carduus*, *Centaurea*, *Cirsium*, *Galinsoga*, *Taraxacum*, *Xanthium*, so an. (ANGHEL 1972, CIOCĂRLAN 1992). Insect fauna, that develops on the both cultivated and spontaneous *Asteraceae* plants, is very rich (KALTENBACH 1874, BATRA et al. 1981, CEIANU et al. 1988, LĂCĂTUȘU & PERJU 1986, PERJU 1983, PERJU & PEIU 1986, PEJU, DUVLEA & PĂLĂGEȘIU 1984, PERJU & MOLDOVAN 1985, 1990, 1991, PERJU et al. 1991).

The inflorescences of *Asteraceae*, with

compound flowers, variously coloured and rich in pollen and nectar, constitute an abundant feeding base for both entomophagous and pollinating insects. Because of this, these flowers attract a lot of *Coleoptera* (*Nitidulidae*, *Chrysomelidae*), *Hymenoptera* (*Apidae*, *Ichneumonidae*, *Chalcidoidea*) and *diptera* (*Syrphidae*). In the meantime the *Asteraceae* stand for host-plants for numerous species of phytophagous organisms, behaving either like deleterious ones for cultivated plants, or like useful ones to combat the spontaneous plants. These plants are the doubtful-weeds in the agroecosystems (in both cases the density of populations is very large), (SCHROEDER 1985).

Material and methods

Investigations were concerned in the period of 1980-1995. The biologic material (phytophagous organisms in different phases of development and organs of attacked plants), was collected from different regions of the country, from 75 species belonging to 18

genera, respectively: *Achillea*, *Arctium*, *Artemisia*, *Carduus*, *Carthamus*, *Centaurea*, *Cirsium*, *Chondrila*, *Galinsoga*, *Helianthus*, *Inula*, *Jurinea*, *Lactuca*, *Matricaria*, *Onopordum*, *Sonchus*, *Taraxacum* and *Xanthium*. The phytophagous organisms that develop on the basis of root system have been made evident through tests made in soil; those who develop on the overground organs of the plants have been collected manually, with the insect net or bred in the laboratory from attacked organs (stems, leaves, blooming, fruits and seeds). The density populations of the phytophagous organisms was established to the surface unit (m²) or to the average test/attacked organs (100 stems, leaves, fruits).

Results and discussion

Roots system of the plants is often affected by the coleopteran larvae (*Melolontha melolontha* L./*Cirsium* spp.; *Otiorhynchus ligustici* L./*Centaurea* spp., so on).

The both vegetative and generative aerial organs of the plants, are the food target of the numerous species of phytophagous, entomophagous and pollinating insects belonging to the orders: Dermoptera, Orthoptera, Thysanoptera, Homoptera, Heteroptera, Coleoptera, Lepidoptera, Hymenoptera and Diptera.

Of the vegetative and generative organs of the *Asteraceae* plants have been collected numerous species of insects, belonging to all the three groups; respectively phytophagous, entomophagous and pollinating group. Thus, of the *Centaurea* spp. plants have been collected 20 species, and of *Cirsium* spp., 61 species of insects. Among the species which appear more frequently and in high density, there are: *Thrips* spp., *Aphis cardui* L., *Phylaemus spumarius* L., *Oxycarenus palens* Wolf., *Carpocoris purpureipennis* Deg., *Setocoris macrophthalmus* Fl., *Orius niger* Wolf., *Chlorophorus viridula* Hbst., *Cassida atrata* L., *Cryptocephalus aureolus* Schr., *Eusomus ovulum* Germ., *Agriotes ustulatus* Schl., *Oxythirea funesta* Poda., *Alophus triguttatus* F., *Otiorhynchus orbicularis* Hbst., *Apis mellifica* L., *Zygaena carniolica* L., *Pocris statices* L., *Chaetorellia jaceae*

R.D..

In the vegetative and generative organs of the plants of this family have been put in evidence 74 species of phytophagous insects whose larva mining in stems and leaves or feed with the floral organs.

- The stems of some plants are mined by the larva of some coleopterans, which are: the tailor (*Agapanthia dahlii*), the beetles with tails (*Mordelista parvula*) both on *Helianthus annuus* and lepidoptera (*Agapeta zaegana*)/*Centaurea* spp..

- The leaf of the plants is mined by the larva of some diptera: agromizide (*Phytomyza atricornis*) and atomiide (*Pegomia carduorum*).

- The flowers of *Asteraceae* plants, as well as the seeds in formation are consumed by many anthophilous and seminiphagous insects. Such a food regime have the species: *Apion hookeri* Kirby., *Larinus minutus* Gyll., *L. obtusus* Gyll., *L. carlinae* (Ol.), *L. jaceae* (F.), *L. sturnus* (Schall.), *L. turbinatus* Gyll., *Rhinocyllus conicus* (Fröl.)/*Carduus* spp., *Centaurea* spp. and *Cirsium* spp.; *Euphrasia affinis*/Silur; *Aethes margaritana* Hw., *Ae. smeathmanniana* and *Oriorrhynchus millefolii* Wachtl./*Achillea* spp.; *Cochylis posterana* Z., *Eupoecilia angustana*, *Metzneria paucipunctella*, *M. neuropunctella*, *Isocolus jaceae*/ *Centaurea* spp.; *Jaapiella cirsii* Fab., *Acanthophilus helianthi* Rossi., *Chaetorellia jaceae* Riley., *Ch. loricata* Rond., *Ensina sonchi* L., *Myopitis blottii* Breb., *Orellia lappae*, *Paroxina bidentis*, *Terellia tussilaginis*, *U. jaceana* Hend., *U. quadrifasciata*

Meig., *U. solstitialis* L., *U. stylata* Fab. and *Hyphosia milliaria*/*Cirsium* spp., *Centaurea* spp. and *Carduus* spp.

From the seminiphagous insects of the cultivated plants of this family are remarked: the sun-flower moth (*Homoeosoma nebulella*), the sofran fly (*Acanthophilus helianthi* Rossi.) and the salad fly (*Pegomyia seneciella*).

Some of the mentioned species are monophagous (11), the others are oligophagous (46) and 17 are polyphagous belonging to the orders: *Thysanoptera* (2), *Homoptera* (2), *Heteroptera* (5), *Coleoptera* (11), *Lepidoptera* (23), *Hymenoptera* (1) and *Diptera* (30).

Through the domination of the species of phytophagous organisms, that develop on the *Asteraceae* plants, year by year outrunning the PED, constituting the potential factors of deleterious, is remarked: sun-flower moth (*Homoeosoma nebulella*), sofran fly (*Acanthophilus helianthi* Rossi.) and salad fly (*Pegomyia seneciella*), (at the cultivated plants). Between the species of the phytophagous insects that play an important role through the level of the diminution of the fructify capacity of a some doubtful-weeds is remarked: *Ensina sonchi* L., *Tephritis eriolepidi*, *T. crepidis*, *T. valida*, *Urophora stylata* and *U. solstitialis*.

Conclusions

Numerous species of *Asteraceae* from our country flora, offer a plentiful feeding base for many species of phytophagous, entomophagous and pollinating organisms.

Of the *Asteraceae* plants have been collected 61 species of phytophagous, entomophagous and pollinating insects.

From the vegetative and generative organs of the plants have been obtained 74 species of monophagous, oligophagous and polyphagous insects, belonging to the orders: Thysanoptera (2), Homoptera (2), Heteroptera (5), Coleoptera (11), Lepidoptera (23), Hymenoptera (1) and Diptera (30).

Some species of the insects constituted in constant biosystems are maintained year by year in dense populations, often outrunning the PED, thus becoming deleterious (*Homoeosoma nebulella*, *Acanthophilus helianthi* Rossi. and *Pegomyia seneciella*); many of them achieve reduced populations, however having an important role in the trophic chain of the respectively biocoenosis.

From phytophagous insects, without those that have been mentioned, that in some years become deleterious for the cultivated plants, we remark many useful species. These contribute to the significant reduction of the capacity of increasing of some doubtful-weeds from the agroecosystems (*Ensina sonchi* L./*Sonchus* spp.; *Tephritis eriolepidis*, *T. crepidis*, *T. valida*, *Urophora stylata*, *U. aprica*, *U.*

solstitialis / *Carduus* spp., *Centaurea* spp., *Cirsium* spp., *Onopordum* spp. and *Carlina* spp.

From the multitude of the phytophagous species on the plants from spontaneous flora it could be remarked those which play a significant role like potential factors for biological control of the weeds.

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