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**COLEOPTERA FOUND ON NEOPHYTE
PRUNUS SEROTINA (EHRH.) WITHIN FOREST
COMMUNITY AND OPEN HABITAT**

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ABSTRACT

Black cherry, *Prunus serotina* (Ehrh) is one of the invasive plant species that, for its ability to negatively affect local plant communities, may deserve particular attention and control measures. The authors present species composition of Coleoptera found on *P. serotina* in two habitats in SW part of Poland. It is the first record of this kind from Poland.

Key words: Coleoptera, black cherry, *Prunus serotina*, Poland, neophytes, invasive plant species.

INTRODUCTION

Mass introductions of *Prunus serotina* as a component of forest stands in Europe since mid XXth century resulted in negative changes in these forest communities [10]. These changes are mostly reduction of plant species diversity within a stand, with the elimination of shade intolerant species in particular. Black cherry also severely limits natural rejuvenation of native forest trees, as well as of the species of shrub and ground layers [11]. It also contributes to increased succession in open biotopes like moors or meadows [8]. It may seem likely that using herbivorous potential of native insect fauna may be one of natural ways to reduce the expansion of *Prunus serotina*. Insects infesting plants may cause damage both by locally depleting green mass of the plant and by triggering systemic morphological or physiological changes. Wimmer and Winkel [12] have reported a significant growth retardation of *P. serotina* in Germany by *Gonioctena quinquepunctata* FABR.. On the other hand, some species of the Trypetidae family (fruit flies), feeding within the generative parts of black cherry at different stages of flower and fruit development, reduce reproductive potential of the plant [7]. Cases of indirect influence of some insect species on *P. serotina* are also reported, namely insects acting as vectors that transmit microorganisms pathogenic to the plant. A well-known vector of spores of the fungus *Monilia*, causing brown rot of stone fruits, is the polyphagous beetle *Rhynchites bacchus*, a member of Attelabidae family (leaf-rolling weevils) [6].

This paper presents preliminary results of one year study on the species spectrum of native Coleoptera infesting or at least visiting black cherry trees in south-western Poland. It also attempts to answer to what extent the invasive plant may become food source for herbivorous Coleoptera. The study is being continued.

STUDY AREA AND METHODS

The research was carried out since 3rd decade of April till the 2nd decade of August 2003, in the vicinity of Lubin, SW Poland (square BE of ATPOL net). Two plant specimens of *Prunus serotina* were observed, growing within two different ecological contexts:

1. as a single-standing plant within an open area (*Plantaginetea majoris* community), at a distance of 800m from the forest edge (site 1, further called “open”),
2. as a component of forest community, where the undergrowth layer covered more than 50% of the forest floor and was dominated by *P. serotina* (*Leucobryo-Pinetum* community)(site 2, further called “forest”).

The insect sampling was carried out at both sites at 7-10 day intervals. Insects were always collected before noon. At each site 8 branches growing approximately 1.5 m above the ground level were marked with a coloured tape. On each of the marked branches 10 leaves were inspected carefully on each date of observation. The data presented in this paper are the result of 16 consecutive samplings at each site. As the collected beetles were not sufficiently abundant, the data are not processed statistically.

RESULTS AND DISCUSSION

At both sites 43 species of Coleoptera were observed, 21 of them at the “open” and 34 at the “forest” site. There were 13 species common for the two sites and 5 of them were Curculionidae. They were: *Furcipes rectirostris* L., *Otiorhynchus porcatus* HERBST., *Phyllobius argentatus* L., *Phyllobius pyri* L. and *Strophosoma capitatum* DE GEER..

The beetle fauna of the “open” site was dominated by Curculionidae, making 63% of all Coleoptera collected on black cherry at that site. At the same time, 3 of the curculionid species made almost 45% of all the collected beetles (Tab. 1) [4, 5]. Most of the curculionids (15 out of 24) were polyphagous *Phyllobius* spp.. Four out of 18 species reported from Poland [9] were collected from *P. serotina* at the “open” site: *Phyllobius argentatus* L., *Phyllobius pyri* L., *Phyllobius maculicornis* GERM. and *Phyllobius oblongus* L. (Fig. 1). The last species was not collected from “forest” site. The other curculionids observed at “open” site were *Furcipes rectirostris* L., the larvae of which feed within the fruit stones of *Prunus*, and *Strophosoma capitatum* DE GEER, *Otiorhynchus porcatus* HERBST, as well as *Curculio salicivorus* PAYK and *Brachonyx pineti* PAYK, the latter two not recorded from “forest” site.

Table 1. Taxonomic composition of Coleoptera on *Prunus serotina*. “Open” and “forest” site, 2003. (# – number of specimens)

Species	Family	Open side #	Forest #
<i>Phyllobius argentatus</i> L.	Curculionidae	9	-
<i>Phyllobius pyri</i> L.	Curculionidae	4	2
<i>Phyllobius arborator</i> HERBST	Curculionidae	-	4
<i>Phyllobius maculicornis</i> GERM.	Curculionidae	1	-
<i>Phyllobius oblongus</i> L.	Curculionidae	1	-
<i>Phyllobiusglaucus</i> SCOP.	Curculionidae	-	1
<i>Phyllobius betulinus</i> BECH	Curculionidae	-	1
<i>Furcipes rectirostris</i> L.	Curculionidae	4	2
<i>Hylobius abietis</i> L.	Curculionidae	-	1
<i>Culculio salicivorus</i> PAYK.	Curculionidae	1	-
<i>Brachonyx pineti</i> PAYK.	Curculionidae	1	-
<i>Otiorhynchus porcatus</i> HERBST.	Curculionidae	1	1
<i>Strophosoma capitatum</i> DE GEER.	Curculionidae	2	1
<i>Magdalis</i> spp.	Curculionidae	-	1
<i>Apion</i> spp.	Curculionidae	-	1
<i>Gonioctena quinquepunctata</i> FABR.	Chrysomelidae	1	7
<i>Coenorhinus pauxillus</i> GERM.	Attelabidae	-	3

Table 1. cont.

1	2	3	4
Rhynchites coeruleus DE GEER	Attelabidae	1	1
Rhagium bifasciatum F.	Cerambycidae	-	3
Clytus arietis L.	Cerambycidae	1	1
Agapanthia villosoviridescens DE GEER	Cerambycidae	1	-
Corymbia rubra L.	Cerambycidae	-	1
Schizotus pectinicornis L.	Pyrochroidae	1	2
Pyrochroa coccinea L.	Pyrochroidae	-	1
Ips spp.	Scolytidae	-	1
Phyllopertha horticola L.	Scarabeidae	3	1
Agrypnus murinus L.	Elateridae	1	1
Ampedus sanguinolentus SCHRANK	Elateridae	-	1
Rhagonycha fulva SCOP.	Cantharidae	-	1
Cantharis fusca L.	Cantharidae	-	1
Cantharis rustica FALL.	Cantharidae	-	1
Coccinella septempunctata L.	Coccinellidae	1	3
Propylea quatuordecimpunctata L.	Coccinellidae	1	2
Anatis ocellata L.	Coccinellidae	-	1
Adalia bipunctata L.	Coccinellidae	-	1
Thea vigintiduopunctata L.	Coccinellidae	-	2
non-determined	-	3	5
TOTAL:		38	55

Beetles other than Curculionidae, found on black cherry at the “open” site are mostly polyphagous species feeding on the plant leaf blade – *Phyllopertha horticola* (Scarabaeidae) (Fig. 2) [1], *Gonioctena quinquepunctata* (Chrysomelidae) (Fig. 3) [3] as well as leaf-rolling weevils (Attelabidae), represented there by *Rhynchites coeruleus* DE GEER. [6]. Predatory Coccinellidae – *Propylea quatuordecimpunctata* L., and *Coccinella septempunctata* L. – were also observed.

Fig. 1. Leaf damage on *Prunus serotina* caused by *Phyllobius* spp. (Curculionidae)

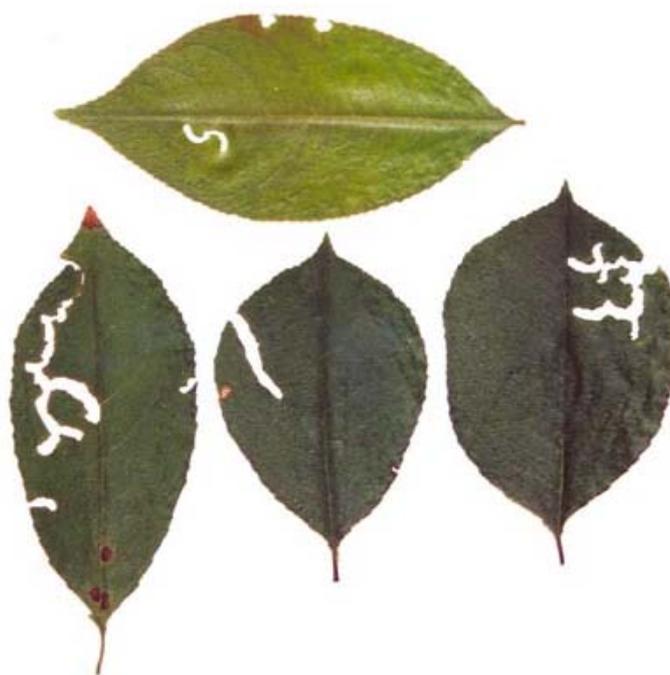


Fig. 2. Leaf blade damage caused by feeding of *Phyllopertha horticola* (Scarabeidae)



Fig. 3. Leaf perforation caused by *Gonioctena quinquepunctata* (Chrysomelidae)



At “forest” site the beetle guild was more fragmented: most of the species were recorded as single specimens. Curculionidae made only about 27% of all the beetles collected, compared with 63% at the “open” site ([Tab. 1](#)) and 8 out of 15 collected Curculionidae belong to genus *Phyllobius*. The dominant species was *Phyllobius arborator* HERBST, absent from the “open” site. Almost all the other curculionid beetles occurred as single specimens. Three species not observed at the “open” site were recorded at “forest” *Prunus*. These were: *Hylobius abietis* L., and beetles from the genera *Apion* and *Magdalis* ([Tab. 1](#)).

Apart from *Rhynchites coeruleus*, another species of Attelabidae, *Coenorhinus pauxillus* GERM. [6], was found feeding on *P. serotina* at “forest” site.

Gonioctena quinquepunctata FABR. (Chrysomelidae) was recorded feeding on *Prunus* leaves and it was the most abundant species collected at “forest” site.

More species of Coccinellidae were recorded from the “forest” site than from the “open” site. The collected specimens were ubiquitous *Coccinella septempunctata* and *Propylea quatuordecimpunctata*, also observed at the “open” site, as well as *Anatis ocellata* L., *Adalia bipunctata* I. and mycophagous *Thea vigintiduopunctata* L..

Black cherry growing at the “open” site was infested by smaller number of Coleoptera and also their species composition was less complex than the one observed at the “forest” site. On the other hand, some of the species found at that site are not trophically associated with *Prunus serotina* and their presence in the collected material can be accidental, resulting from the insects’ movement within the plant community that contains their proper host species. Namely, both the beetles: *Corymbia rubra* I. and *Rhagium bifasciatum* F. (Cerambycidae) [2], as well as *Hylobius abietis* L. (Curculionidae) that were found at “forest” situation and were absent from the “open” site, are the insects associated with coniferous hosts, including pine, *Pinus sylvestris* L..

Some Coleoptera, and Curculionidae in particular, reproduce once in a season and the adults appear on plants only in May. This may explain why some of the species occurred in the sampled material only on one date.

In general, beetles didn’t visit *Prunus serotina* abundantly. The presence of mostly polyphagous species indicates that the plant has been already colonized by such insect herbivores. As these also include taxa more often associated with *Rosaceae*, and with *Prunus* spp. in particular, like *Gonioctena quinquepunctata*, *Coenorhinus pauxillus* and *Rhynchites coeruleus*, presumably for these insects *Prunus serotina* will become new host. However, it seems unlikely that they are capable of reducing the population growth of that plant significantly.

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