

**INCIDENCE AND LIFE CYCLE OF CEUTORHYNCHUS SPECIES ON RAPE**

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**Introduction**

Cruciferous plants are playing a significant role in our nutrition nowadays, as they are abounding in vitamins and provide essential fibres for our food. There are numerous species of cruciferous plants (Brassicaceae) cultivated in Hungary. Their production area varies between 85-130 thousand hectares and the quantity of their yield fluctuates between 400-500 thousand tons every year. Winter canola (*Brassica napus* LINNAEUS ssp. *oleifera* f. *biennis*) is cultivated on the largest field among them. Although summer canola (*Brassica napus* Linnaeus ssp. *oleifera* f. *annua*) would not be damaged to a degree by pests under home circumstances, its growing is not economical because of its much lower crop yield. In the case of the oilseed rape one of the preconditions of attaining outstanding yield averages is to satisfy the agrotechnical demands of the plant (soil cultivation, variety, sowing time, nutrient replacement, etc.), the other is a successful pest control. The most important pests of rape in early spring are pollen beetles (*Meligethes* spp.) and weevils (*Ceutorhynchus* spp.), which can endanger the yield greatly (Marczali et al. 2006). They cause considerable damages in years when their settling is followed by changeable weather, cool and warmer periods alternating each other (Kuroli and Németh 2003, Graham and Gould 1980, Ferguson et al. 2003). Among *Ceutorhynchus* species *C. pallidactylus* causes reasonable damage but *C. obstrictus* can cause severe problems (Hertelendy et al. 1975, Buntin 1999). *Ceutorhynchus napi* is a more important pest in Western Europe than in Central Europe. The importance of *C. pleurostigma* as a rape pest can be considered moderate or occasional (Jakabfi and Ruszin 1977).

We observed when *Ceutorhynchus* adults emerged from their wintering places and selected their food plant. We were able to identify the following four species: *Ceutorhynchus pallidactylus* Marsham, *Ceutorhynchus obstrictus* Marsham, *Ceutorhynchus napi* Gyllenhal, *Ceutorhynchus pleurostigma* Marsham.

**Material and methods**

Our studies were aimed at giving a picture of the *Ceutorhynchus* species doing damage in oilseed rape. We performed studies on swarming phenology of them on an experimental plot (40 x 30 m) in early spring of four consecutive years (1999-2002). Location of our investigation was Keszthely. In order to be able to follow closely the emergence of adults from the wintering places, leaf litter samples were collected in late autumns of years. We gathered dead fallen leaf samples from 0.25 m<sup>2</sup> areas to make sampling units. The samples were then placed in three-ply paper bags. Glass receptacles were attached to the openings of the bags establishing separator bags which then were put on the insectary of the Department of Entomology. The separator bags were checked up every day. After the emergence of the first beetles in the receptacles Moericke's yellow plates were placed in

the trial plot. At that time there were often night frosts so we had to add some salt to the water in order to decrease the freezing-point. In addition to it we dribbled five drops (approx. 1g/l) of washing-up liquid into the water to reduce the surface tension. The plates were used as a signalization method to predict the beginning of the mass swarming into the plant stock. Every three days after settling beetles were collected only by netting, using Manninger's sweep-net. In order to obtain a sufficient number of adults for the identification of species, on each occasion three times ten net-strokes were made both on the edge and in the middle. Adults caught per ten net-strokes were handled separately. Hund Wetzlar stereo microscopes were used for identifying the weevils. Morphological marks, served as a basic to the identification of the species e.g. the motifs constructed from the scales covering the body, the colour of the legs, the number, size and shape of the teeth on the forelegs, the jumping-off places of the antennae in the probosces, the size and shape of the body, the length of the proboscis, the shape of the prothorax, the villosity and squamation of the wing-cases.

In addition to it developmental stages of *Ceutorhynchus pallidactylus* and *Ceutorhynchus obstrictus* were examined in each year. Therewith we observed the feeding and mating behaviour of these species. At the beginning of the swarming we planted out rape plants into five plastic bins containing fifteen litres soil, and then covered them with mesh tissue. These newly established isolators were placed in open-air circumstances beside the trial plot. Thereafter we regularly watched the isolators making notes of the egg laying and the point of time when first stage larvae, pupae and new adults emerged. With the help of it we were able to make comparisons among the species in the four consecutive years.

### Results and discussions

The meteorological conditions of the examined years were different but we can find similarities between the features of the temperatures and the swarming periods as well. The early spring of 1999 and 2002 was quite similar. The coming out of *Ceutorhynchus* species of their hibernation places started early in February in both years. The curve of the swarming had two peculiar peaks in 1999 and in 2002. The peak in early March was followed by cold snap so the swarming could culminate only from the end of April. The weather conditions in spring of 2000 were comparable to those in 2001. The coming of spring was not so early than in the two other examined years. Settling into the field became multitudinous from the end of March. There were not two specific peaks on the curve of swarming instead there was a progressive rise and a decline in the number of adults netted in the field. We detected the dominance of two species within the *Ceutorhynchus* genus. *C. pallidactylus* and *C. obstrictus* were dominating among the four discovered species in each examined year. *C. napi* occurred in each year but in a substantially lower number than the dominating species. The appearance of *C. pleurostigma* in early spring can be ascribed to the adults of the spring-race of this species which never lays eggs in winter canola. Individuals netted in early summer were however the adults of the autumnal race of *C. pleurostigma* which had taken nourishment before their summer estivation (Figure 1.).