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ПРОБЛЕМЫ СОХРАНЕНИЯ БИОЛОГИЧЕСКОГО РАЗНООБРАЗИЯ И ИСПОЛЬЗОВАНИЯ БИОЛОГИЧЕСКИХ РЕСУРСОВ

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Из литературных источников следует, что оптимальным режимом для хранения дрожжевых культур в замороженном состоянии является консервация при температуре -70 °С. В связи с этим, для проверки сохранения жизнеспособности культур дрожжей молочнокислого брожения при хранении в условиях низких температур клетки замораживали при -70 °С с использованием криозащитных сред и хранили 12 месяцев. После оттаивания, образцы вносили в свежую стерильную питательную среду и культивировали 72 часа, каждые 24 ч отбирая пробы и измеряя ОП. Стоит, однако, отметить, что скорость накопления биомассы при культивировании дрожжей после криоконсервации восстановилась только на вторые сутки культивирования и была соизмерима с контролем. Было показано, что 10%-ные растворы сахарозы и глицерола оказывают выраженное защитное действие при длительном хранении молочных дрожжей в замороженном состоянии.

В Белорусской коллекции непатогенных микроорганизмов для поддержания биологического разнообразия дрожжевых культур используют методы субкультивирования, лиофилизации, криоконсервации. В последнее время широкое применение находят методы низкотемпературного хранения.

CARABIDS IN CITY CENTER: LIGHT ATTRACTION AND SURVIVAL STRATEGIES

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The "asphalt desert" of centers of larges cities represents a very unsuitable environment for Carabid beetles. In spite of it, in certain places of large European cities (Bratislava, Brno, Praha, Craiova) surprisingly rich temporal aggregations of Carabids can be found on some extremely illuminated places. In the last 10-12 years the problem of light attraction of some Carabids, first of all of the abundant fields species, especially of *Pseudophonus rufipes*, became even a serious hygienic and social problems, as these beetles penetrate the city centers, supermarkets or apartments in huge amounts and disturb the uninformed public or personnel.

Spatial distribution of the light attracted Carabids in the city is very unequal. They concentrate on places, where the illumination intensity exceeds 1000 lux and the light temperature reaches about 5000єK.

Species diversity of Carabids occurring in individual illuminated places varies considerably. On the turn of July and August, the aggregations in most places consist of *Pseudoophonus rufipes* accompanied by P. *griseus, P. calceatus*,

Calathus melanocephalus, Amara consularis and *Dolichus halensis*, while in September *Trechus quadristriatus* strongly predominates. These species can be easily observed by night at any visit in any illuminated place. But during longer systematic observations in a suitable place, an assemblage of even 40 species can be found. All predominating species are typical inhabitants of arable land in the city surrounding and, to certain degree also of large parks, without a dense shadowing by wooden plants. In smaller cities in Slovakia (Nov? Mesto nad V?hom in summer 2009) their aggregation is directly connected with immediate neighborhood of some streets with maize fields, in which these species are usually very abundant.

A small portion of such assemblages consists of the hydrophilous riverbank or wetland species (e.g. *Bembidion biguttatum, Elaphrus uliginosus, Chlaenius spoliatus*). Most of them are typical autumn-breaders.

Number of individuals in a place may range from several tens to several hundreds. The richest concentrations can be found during the warm nights before passing a frontal system.

The regular marking and recapturing of the Carabids in a place shows, that major part of the attracted beetles fly away within 2-3 hours. But a minor part of them settles and searches for food and a suitable cover. The most preferred covers are windows of cellars or cleaning opening of gutter pipes, especially if some plants grow around then. The ant galleries at foot of buildings are also used. The beetles enlarge and deepen them and use to sit in them, with head and pronotum projecting outward, like "looking from a window".

The food resources are very variable. Most individuals attach other small insect, especially small cicadas accumulated under the illumined walls or windows. But they also eat the trampled or naturally died congeners. The myxophagous representatives of the genus *Harpalus* and related genera also use any wet wastes, like rests of fruits, drops of ice-cream and other rests of human food thrown away. Even the fresh feces of dogs are attractive and visited. If possible, they also sometimes ascend on grasses or other plants and eat their grains or seed.

The regular marking of the beetles with a code making possible to note the date has shown that most individuals survive in such places 1-2 weeks, but some marked beetles were recaptured even after 5-7 weeks. As the beetles are obviously able to remove the marks, it is probable that their real survival may be somewhat longer.

The survival is closely connected with the live form (in sense of Sharova, 1981) of individual species. The myxophytophagous geochortobionts (mostly *Harpalus, Pseudoophonus*) use to walk along the walls, but from time to time they undertake "trips" in center of the pavements and move there chaotically in irregular trajectories. They return to the relatively secure zone along the wall after several minutes and, in dependence on frequency of pedestrian they often

become victim of trampling. On contrary, the zoophagous stratobionts living in cracks (in this case *Dolichus halensis* or species of *Chlaenius*) undertake very sudden attacks into the pavement center to search for food. They move on a direct and smooth trajectory and usually they return to the starting point within several tens seconds. They show an excellent orientation and spatial memory. Thus their chance for survival is much higher. Probably this hunting strategy is connected with their adaptation to life on riverbanks, between stones.

Such aggregations of Carabids on illuminated places in city centers begin to form usually in mid-July. Since the last decade of August, number of individuals in the aggregations declines, but the last surviving individuals (mostly *Pseudophonus calceatus*) can be observed in late October.

It can be concluded that the enormous light attraction of Carabids to the city centers and their temporal aggregation there results from the excessive illumination of city centers, significant buildings or historical monuments, large advertisement billboards and shop windows. Although it is evident, that major part of the migrating beetles is able to escape from the "light traps" represented by the strongly illuminated places, this phenomenon as such can be considered as one of serious and undesirable manifestations of light pollution.

In general it can be sad that the aggregated Carabids in city centers are not injurious. However, if their occurrence causes some problems, the only effective defense seems to be switching off of the intensive light sources during period of night migrations of these beetles, especially in warm evenings.

ХЕМОРАССЫ РАСТОРОПШИ ПЯТНИСТОЙ РАЗЛИЧНЫХ БОТАНИЧЕСКИХ САДОВ ЕВРОПЫ

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Введение. Расторопша пятнистая (*Silybum marianum L. (Gaertn.)*) – одно- или двулетнее травянистое растение, достигающее в высоту 1,5 м. Цветы собраны в соцветия корзинки, расположенные поодиночке. Плод – семянка с хохолком из волосков на конце, от черного до светло-коричневого окраса. Родина растения – Средиземноморье. Также встречается в центральных и южных районах европейской части России, в Украине, Западной Сибири, на Кавказе, Средней Азии. В этих странах она произрастает на заброшенных полях, старых пастбищах, вдоль дорог. Для решения лекарственной сырьевой базы в Республике Беларусь, так же как и в других странах, промышленно культивируется.