♦Bielen Ana[1], Branka Bruvo-Mađarić[2], Ivan Vujaklija[3], Tina Paradžik[2], Pezer Željka[2], Pavle Goldstein[3], Dušica Vujaklija[2]

Scanning for GDS(L) hydrolases in Actinobacteria from variety of ecological niches

[1]Department for Biochemical Engineering, Faculty of Food Technology and Biotechnology; [2]Department for Molecular Biology, Ruđer Bošković Institute; [3]Department of Mathematics, Faculty of Science, University of Zagreb, Zagreb, Croatia

Due to their multifunctionality, GDS(L) hydrolases have great potential for application (e.g. in food, pharmaceutical and detergent industry). The member of this protein family often exhibits various catalytic activities like lipase, phospholipase, esterase and thioesterase and has broad substrate specificities. However, finding new GDS(L) enzymes using BLAST is difficult due to their low sequence similarity. Therefore, two different methods were applied for GDS(L) motif-scanning: Viterbi decoding and posterior decoding, developed here. In addition, searching for novel members of GDS(L) family was accelerated using automated GDS(L) detection pipeline. We have shown that Actinobacteria from wide variety of ecological niches posses high number of genes encoding for GDS(L) enzymes. We have found 484 GDS(L) enzymes in 77 actinobacterial proteomes (up to 26 per proteome), majority coming from soil-inhabiting species. Clustering and phylogenetic analysis divided these enzymes into 8 well defined groups. Further, horizontal gene transfer had a significant impact on evolution of actinobacterial GDS(L) genes and it can be hypothesized that these enzymes facilitated adaptation to novel ecological niches, e.g. saprophytic lifestyle in soil. Moreover, we have found interesting variations in active site amino acids that possibly reflect novel enzyme properties of biotechnological interest.

Examination of Entomopathogenic Fungi on Western Corn Rootworms

Attila Tapasztó, Áron Németh, Béla Sevella

Budapest University of Technology and Economics, Department of Applied Biotechnology and Food Science

The Western corn rootworm (*Diabrotica virgifera*) is a major maize pest in North America and Europe. In 1992, the pest was found by entomologists in Europe, and already at the time of discovery the pest has caused economic damage. The appearance and spreading of the corn rootworm highly influenced European (and national) corn production. Currently there is no commercially available insecticide specific to Western corn rootworm. General, broad-spectrum insecticides or rotation of crops or combined methodes are used against this bug. One of these important chemical groups are the neonicotinoids, a neuroactive insecticide group chemically similar to nicotine. The European Commission's decision accepted on 25.5.2013 restrict the use of three commercially avaible neonicotinoid insecticides (Clothianidin, Imidacloprid and Thiamethoxam). They might be harmful and risky on honeybees according to the attitude of the European Food Commission and the EU Reference Laboratory for Bee Health. Limiting the use of these chemicals can cause a serious problem in the protection against pests (such as the controll of the corn rootworm) in the EU States. The solution could be the usage of entomopathogenic fungi in integrated pest management (IPM), such as *M. anisopliae* and *B. bassiana*. Some studies have shown that *M. anisopliae* have no adverse effect on bees, on the contrary some strains are used to protect them against mites (*Varroa destructor*) which cause massive destruction of the bees. Thus, the *M. anisopliae* could be a potential commercial product to replace the restricted insecticides, and furthermore we aimed to develop an effective way for *M.anisopliae* production.

FIRST REPORT OF *ERWINIA AMYLOVORA* CAUSING FIRE BLIGHT ON CHERRY PLUM IN HUNGARY AND SUSCEPTIBILITY OF CHERRY AND SOUR CHERRY CULTIVARS

♦ Anita Végh, Anita Dudás, László Palkovics

Department of Plant Pathology, Faculty of Horticulture, Corvinus University of Budapest, Budapest, Hungary

Fire blight, a plant disease caused by the bacterium *Erwinia amylovora* (Burrill) Winslow et al. (1920), produces serious losses in apple and pear production all over the world. The disease endemic in the USA and known for about 200 years had been introduced to Europe (England) in 1955, and has been spread now all over the world. Fire blight was first detected on apples in 1996 in Hungary (Nyárlőrinc), and later in pear orchards. The Rosaceae family 200 species belonging to 40 genuses can be regarded as its host plant. The most important host plants from view of commerce are the species from the *Cotoneaster, Crataegus, Cydonia, Malus, Pyrus, Photinia, Pyracantha* and *Sorbus* genus. In the past year more and more literature has been published about the appearance of the pathogen at new host plants, like Japanese plum (*Prunus salicina*), European plum (*Prunus domestica*), and apricot (*Prunus armeniaca*) and from the hybrid of European plum and apricot (Pluot®). In Hungary the bacteria has been subscribed first time from cherry plum (*Prunus cerasifera*). Appearance of shoot blight was observed on a cherry plum tree in Budapest, Hungary during the summer of 2011. The cherry plum shoots showed typical symptoms of fire blight: blighted, young succulent terminal shoot with brown to black necrotic lesion, wilting and shepherd's crook on affected stems, leaf blighting. The pathogen examined by classical and molecular tests. The infected shoots were analysed the laboratory of Department of Plant Pathology of Corvinus University of Budapest. The pathogen were identified with classical (morphological, biochemical and physiological properties, pathogenicity test) and molecular (16S rRNA) methods. After the identification were performed artificial infection on cherry flowers and fruits. The foreign and domestic analytical methods were used, and infection scales were modified. To determine the susceptibility/resistance of cultivars we relied on the symptoms on flowers and fruits. The cultivars various plant organs had different resistance. To characterize resistance, the resistance of the flower should be in the focus. The shoot and fruit tests complete the results of resistance tests and aid successful breeding programs in the future.

The project was funded by TÁMOP 4.2.2./B-10/1-2010-0023.