Schmallenberg-Simbu group viruses' circulation in Romanian's livestock from South-West Oltenia Region

Marius Andrei Manescu*, Stelian Baraitareanu, Gurau Rodica Maria, Doina Danes

Department of Clinical Sciences, Faculty of Veterinary Medicine, University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania

E-mail address: danes.doina@gmail.com (M.A. Manescu).

Prevalence of Simbu sero-grup viruses (*Schmallenberg virus*) in some Europe's herds can reaches 90%. Romanian serological studies revealed a prevalence of 22% in cattle and 5% in small ruminants' local breeds. The objective of the present study was to detect the Schmallenberg virus RNA using real-time RT-PCR. The samples (5 ml of whole blood into EDTA tube) were from three sheep flocks and six cow farms, situated in the South-West Oltenia (Romania). All samples were from animals with history of congenital malformations and stillbirths: 13 sheep samples and 6 cow samples. Real-time RT-PCR carried out in accord with the manufacturer's recommendations (Virotype SBV RT-PCR Kit Qiagen, Germany). Reaction mix was performed in 25 μL volume (20 μL master mix and 5 μL RNA-extract). It was used the following temperature protocol: one cycle of 45 °C – 10 min.; one cycle of 95 °C – 10 min.; 40 cycles of 95 °C – 15 s, 56 °C – 30 s, 72 °C – 30 s. The positive control has Ct value 25.90. All sheep samples were negative and one cow sample was positive (Ct value: 20.93). The detection of SBV-RNA by real-time RT-PCR support the serological data previously reported. These evidences bring forward customized studies in order to proper evaluate the risk and the costs.

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Biological control of *Odontothrips loti* (Hal.) with anthocorid predators, *Orius minutus* (L.) and *Orius niger* (Wolf.)

Virteiu Ana Maria*, Grozea Ioana, Stef Ramona, Carabet Alin, Molnar Levente, Mazare Veaceslav

Department of Biology and Plant Protection, Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" Timisoara, Romania

E-mail address: anamaria.badea@gmail.com (V.A. Maria).

The apionidae weevils and *Odontothrips loti* (Hal.) are serious pests of *Lotus corniculatus* in Banat region (Timis, Romania). These pests regularly cause economic damage to the *L. corniculatus* crop for seeds production. The main natural enemies of thrips found in Romania are *Orius minutus* (L.) and *Orius niger* (Wolf.).

In the present study, *O. minutus* and *O. niger* were identified in *L. corniculatus* fields of Banat region. The study results of the abundance species indicate that these anthocorids are major predators of these pests in *L. corniculatus* fields.

O. minutus and *O. niger* were collected by sweep net from unspeayed *L. corniculatus* fields during June and July of 2013 and 2014. Those anthocorid predators were released into specially designed cages in the fields. In the earlier stage of trial, the *L. corniculatus* plants were artificial infested with thrips, and later were exposed to the predators' *O. minutus* and *O. niger*.

After four-week period the number of thrips/plant increased from 15 to 45 thrips in control variant without *O. minutus* and *O. niger*, while the number of thrips/plant decreased from 15 to 1.5 thrips/plant in the presence of the two anthocoridae predatory species.

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Efficiency of human resources at national and multinational companies

Remus Gherman, Bogdan Adamescu*, Ioan Brad, Ana Mariana Dincu

Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Romania

E-mail address: maridincu@gmail.com (B. Adamescu).

Contemporary economy is supported through the activity developed both in national companies, as well as in those multifunctional witch are structural economic entities constituted from interacting subsystems and adaptable to changes from the interior, and also to the pressures from the outside.

Complexity of national and multinational companies generates the necessity of a new reconsideration of human resources and of the management of these resources determining the appearance of new marks of their analysis.

In Romania there are about 2000 national and multinational companies with over 250 employees, but less than half of them have a software solution for managing human resources, used in particular to legal issues or operational such as salaries, calculation and planning the holidays, recruitment. Human resources departments completely ignore the time management, the calculation of the efficiency, training needs, career development and other fundamental elements for employee loyalty and increasing the employee's profitability.

In a general approach, the efficiency of human resources management at national and multinational companies refer to both spheres of human activity productive and unproductive targeting the actions of obtaining the maximum effect with minimum effort, expenses and time from the human resources.

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Aerobic granular sludge – Microbial and morphological characterization

Ioana Alexandra Ionescu*, Costel Bumbac, Mihai Nita Lazar

National Research and Development Institute for Industrial Ecology – ECOIND, Bucharest, Romania

E-mail address: ioana.ionescu@incdecoind.ro (I.A. Ionescu).

Biological wastewater treatment processes have a crucial importance to the modern world, due to the ever increasing need of sanitation and pollution control in urbanized areas. Aerobic granular sludge represents an alternative for the conventional biological system. Recent studies have greatly expanded the vision on aerobic granular sludge morpho-functional and microbiological peculiarities and their influence on wastewater treatment performance and behavior. The microbial composition of the granules obtained in a sequencing batch reactor – SBR, were characterized using microscopy and molecular biology techniques. Scanning electron microscopy investigations, revealed insights into the granules morphology and structure: size, pore dimensions, presence of filamentous bacteria. Molecular biology techniques were used

to determine the presence and abundance of biotechnologically useful bacteria (nitrifiers, denitrifiers) in the sludge granules samples. The samples were subjected to PCR amplification using the following primers: specific for ammonium oxidizing bacteria; specific for nitrite oxidizing bacteria; universal bacteria primers. The results indicated the presence of nitrifying bacteria specific genes belonging to *Nitrosomonas* sp., *Nitrospira* sp., and *Nitrobacter* sp., species responsible for nitrification. The abundance and diversity of identified microbial species were correlated with the treatment performances registered for the operational sequencing batch reactor.

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Allelopathic effect of aqueous extracts from *Datura stramonium* on germination and plant growth of maize plants

Stef Ramona*, Carabet Alin, Virteiu Ana Maria, Molnar Levente, Manea Dan, Grozea Ioana

Banat's University of Agricultural Sciences and Veterinary Medicine "Regele Mihai I al României" from Timisoara, Romania

E-mail address: chirita_ramona@yahoo.com (S. Ramona).

The study aimed to highlight the allelopathic effect of aqueous extracts of *Datura stramonium* produced on corn plants. Weeds cause substantial production decline in agriculture through direct and indirect effects. The importance of this paper is conferred both by studied crop and species *D. stramonium* considered ruderal weed, but in recent years is present sporadically in maize. The research was carried out under laboratory conditions. Each extract containing 100 g dried material was added to 8000 ml of distilled water and placed on magnetic stirrer for 24 h, after which filtration was carried out. From this extract three concentrations were made (20%, 50% and 80%). The experiment included 10 variants, in three repetitions. The researches revealed that aqueous extracts of *D. stramonium* plants exerted an allopathic inhibitory effect on maize plants. The highest quantity of tropane alcaloids is found in the extract from the Jimsonweed leaves. In the variants treated with the extract were recorded the lowest values on germination (40%) and plant height of maize (5.57 cm), negative results are very significant compared to the control. In second place were situated Jimsonweed stems extract. The lowest quantities of hyoscyamine and scopolamine were found into the root.

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Bioindicators of community structure in microalgae-bacteria processes

Olga Tiron*, Costel Bumbac

National Research and Development Institute for Industrial Ecology – Ecoind, Bucharest, Romania

E-mail address: olga.tiron@incdecoind.ro (O. Tiron).

For many decades, microalgae biomass has been representing a valuable resource for anthropic ecosystems. An important step was achieved in microalgae-based technologies field once with finding that relationship established between microalgae and activated sludge could revolutionize conventional wastewater treatment systems, with establishment of the sustainable treatment strategies. In conventional activated sludge processes, protozoan species represent indicators of the operating conditions and treatment performance. However, low level of knowledge was found to be addressed to bioindicators in microalgae-bacteria processes. Thus, the study focused on investigating protozoa dynamics during low-strength wastewater treatment using microalgae-bacteria system. Experiments were performed using a photobioreactor operated in sequential batch operation mode. During the first treatment batches, protozoan community was characterized by a high species richness represented by ciliates and testate amoebae, small free-swimming ciliates being the prevalent taxa- diversity comparable with that reported in the early stage of the activated sludge development. A transition stage of the protozoan community followed once with biomass development, the disappearance of testate amoeba and development of stalked ciliates populations being noticed. However, a reduction of species richness was recorded after transition stage, a tendency that has led to a complete elimination of the protozoan community. Taking into consideration operating conditions, it was concluded that microalgae-bacteria processes are different from those of activated sludge regarding protozoan community structure. However, microalgae-bacteria processes sustained the development of metazoan community, a high abundance of rotifers populations being recorded at the end of experiments.

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Arsenic accumulation and toxicity in arsenic-resistant and non-resistant plant species

Paulo J.C. Favas[1,2]

[1] *School of Life Sciences and the Environment, University of Trás-os-Montes e Alto Douro, Vila Real, Portugal*
[2] *MARE – Marine and Environmental Sciences Centre, University of Coimbra, Portugal*

E-mail address: pjcf@utad.pt.

Tailings of Vale das Gatas mine (Northern Portugal) contain high concentrations of arsenic (541–5770 mg/kg) and heavy metals such as lead and zinc. Colonizing plants, such as *Agrostis castellana* Boiss. & Reut., may have developed resistance to these metal(loid)s. The average values of arsenic concentration in *A. castellana* range from 13.2 mg/kg (stems) to 30.9 mg/kg (leaves). Due to the chemical similarity, phosphate and arsenate can compete either for the same adsorption sites on soil particles, either by the same absorption mechanisms by the roots. In this study, plants of *A. castellana*, resistant and nonresistant to arsenate, were tested in relation to As(V) ion as a possible damaging agent of root membranes *in vivo*. The tolerance to As(V) was tested by a "root growth test" on specimens from the tailings, with reference to a sensitive population collected outside the mine influence. The tolerance index is the ratio of the average "maximum roots growth" in the presence of As(V) and the average "maximum roots growth" in the absence of As(V) to several arsenic concentrations (10, 20, 40, 80, 160, 320, 640, 1280 μM). The results allow verifying tolerance indices significantly higher in specimens that grow up in tailings (59.3% maximum), compared with specimens from non-contaminated areas (29.5% maximum).

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