other natural compounds, such as stone dusts or vegetable oils, are tested. First laboratory results of combined applications of Beauveria bassiana spores and vegetable oil have shown a potential increase in beetle mortality due to improved fungal infection. The exploitation of synergistic effects and innovations in formulation technology should result in a better spores persistence under field conditions and a higher efficacy of the fungal treatments against pollen beetles.

References

Poster / Microbial Control. Wednesday, 16:30. **MC-14**
Pathogenicity and virulence of Beauveria spp. against mountain pine beetle, Dendroctonus ponderosae (Coleoptera: Curculionidae: Scolytidae)
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The mountain pine beetle (MPB), is a forest pest to western Canada and the United States and causes severe disturbance in lodgepole and other pine forests. We evaluate pathogenicity and virulence of number of Beauveria spp. including the two commercial strains of B. bassiana, GHA and Naturalis against adult MPB. All the 29 isolates tested in the preliminary bioassy proved to be pathogenic to MPB adults. Mean survival times (MST) of MPB adults when treated with 1 x 10^6 conidia/ml falls between 4.05 to 8.95 days and the commercial isolate GHA is the most virulent (MST 4.05 d), followed by isolates INRS 211 (MST 4.59 d), and INRS 236 (MST 4.82 d) based on the log rank test. Among the 3 different species tested, B. bassiana isolates were highly virulent followed by B. pseudobassiana. The B. bronniari isolated in heroes used in this study were neither virulent nor supported conidia growth on the cadavers. From this initial screening, seven isolates of B. bassiana viz., GHA, Naturalis, INRS 211, INRS 236, INRS CFL-A, L49-1AA, and ARSEF 8150, were selected based on their virulence as well as mycosis/condiasis for further dosewise bioassy. Based on the LD50 values, the commercial isolates, GHA and Naturalis were the most virulent to MPB, however, isolates INRS 236 and INRS CFL-A were the better conidia producer. The result obtained from this study was used in selecting amendable and virulent Beauveria isolates to be deployed in managing MPB through classical biological approaches in a trap based auto-contamination-dissemination strategy.

Poster / Microbial Control. Wednesday, 16:30. **MC-15**
The Use of Microbial Plant Protection Agents for Insect Control in Germany
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Micro-organisms play an important role in biological plant protection in Germany. By the Directive 2009/128/EC on the sustainable use of pesticides, biological control measures are proposed to be enforced in order to reduce the application of chemical pesticides in Europe. To obtain information about the scale of application of biological control agents in Germany, we have performed a survey on their use. Two baculoviruses are registered for loricrisis in Tropica and e disease (IPM). So far, there is no entomopathogenic product registered as plant protection agent in Germany. However, some strains of Beauveria bassiana, B. brongniari or Metarhizium anisopliae have been used for research purposes or for restricted use with a specific legal allowance. The data are presented in the Status Report Biological Plant Protection, which is published every five years by the Julius Kühn Institute and represents an indicator of the National Action Plan to monitor the use of plant protection products.

Poster / Microbial Control. Wednesday, 16:30. **MC-16-STU**
Synthesis and secretion of volatile organic compounds by Triatoma infestans infected with Beauveria bassiana, Luciana S. Lobo1,2, Sergio J. Mijailovsky1,2, Maria Patricia Juarez1, Christian Luz1,2, Everton K. K. Fernandez2, and Nicollas Pedros1nto Instituto de Investigaciones Bioquimicas de La Plata (CCT La Plata CONICET-UNLP), Facultad de Ciencias Medicas, La Plata, Argentina; 1Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, Brasil
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Physically disturbed Triatoma infestans adults secrete volatile organic compounds (VOC) with alarm and defense function. It is still unclear whether infection with entomopathogenic fungi changes or not the profile of these volatiles. The aim of the present research was to study the effect of B. bassiana on secretion of VOC by T. infestans and to study the expression of genes potentially involved in the biosynthesis of these volatiles in triatomines infected or not. Volatiles released by T. infestans on different periods after treatment (1-4, 6-10, 11-15 days) were quantified and identified employing capillary gas chromatography coupled to mass spectrometry. The expression pattern of Ti-bmq and Ti-bckndc was analysed by real-time PCR. 4 and 10 days after treatment, Isobutyric acid was the most abundant VOC found (70 to 78% of the total) with no significant effect of the progress of infection on quantitative secretion of this compound. Secretion of propionic acid, however, was highest in the beginning (18.6±5.8%) and decreased distinctly with the progression of infection and at this time did not differ from values found for the control. Highest expression of both genes was found on insects 4 days after treatment. Significant difference was found in Ti-bmq expression, with 1.32±0.5 and 3.0±0.4 fold induction over the controls in insects treated with 1x10^0 and 1x10^6 con/ml, respectively. Similar results were observed for Ti-bckndc expression, resulting in 1.9±0.3 and 2.5±0.4 fold induction, respectively. The results help to understand better the impact of fungal infection on the chemical ecology of T. infestans.