

Preface

While having the honor of finalizing the ICPPR proceedings with writing a foreword, almost all of us find ourselves in currently extraordinary and unexpected circumstances. Only two bee-brood-cycles ago the world was so different - while the Corona-Virus (COVID-19) has definitely had remarkable and memorable impact on the human population. In this global threat that touches each of us personally, it becomes obvious that like other species, *Homo sapiens* is vulnerable in terms of how rapidly/extensively disease can spread. Considerable global resources are being directed toward investigating routes of transmission, potential exposure, necessary distance and interactions of different factors influencing individual health/susceptibility all toward mitigating the severity of the pandemic. This pandemic demonstrates, how important it is, that science detangles all suspicions and assumptions, and provides the necessary knowledge to conclude on appropriate risk mitigation measures.

These efforts have some similarities with those of the ICP-PR Bee Protection Group in helping to identify factors associated with and inform science-based solutions for declines in bee health-detangling the impact of individual and also multiple stressors, with a focus on the side effects of plant protection products.

Trying to maintain normality, I am very grateful that with some difficulties it has been possible to keep the track of compiling these proceedings, which contain many well written, informative articles on a wide range of topics on bees, with the focus of assessing side effects of pesticides on honey bees (*Apis mellifera*) and non-*Apis* bees. These proceedings reflect the many varied and complementary laboratory and field-based research activities that are helping to define and advance the state of the science within the area Bee Protection. The bandwidth and progress also suggest that our 2 year-cycle is appropriate for the Bee Protection group symposia.

For many years, bees have faced multiple factors that have changed our understanding and practice of beekeeping and the need to have a science-based understanding of the factors so that reasonable and prudent mitigation measures can be developed. While beekeeping is certainly very different in the different parts of the world, the multiple factors influencing bee health are likewise complex to understand. While the potential side effects from active substances from plant protection products and the interactions with bee health may also be influenced by local or regional conditions, use patterns, exposure levels, duration and specific mode of actions- certainly the link of man-made stressors and the interaction with natural factors has justifiably received more attention.

The current situation with COVID-19, its rapid spread, the startling losses of human life, and its effects on the global economy have prompted considerable anguish and fear as governments work to mitigate the factors influencing the spread of and susceptibility to the virus and the wake that it is leaving in its path. While social distancing is proving to be an effective means of reducing the rate of transmission, there is also a growing recognition that governments/nations need to act collectively to address this global threat through high quality science. For many years now, bees have been facing similar threats. For honey bees and wild bees there continue to be numerous speculations, perceptions and emotions on the factors influencing individual bee health, colony or population dynamics and finally also abundance; however, it is more important than ever before, that science raises its voice, provides robust evidence and helps in detangling the factors, in order to take effective measures.

In order to protect bees, there is a need to move away from speculation and perceptions toward a more factual approach. It is necessary to investigate what the facts tell us, how these have been generated, and to determine the extent to which the underlying methodologies and studies are robust. Otherwise, as a society, we may focus on the wrong measures to protect bees and will squander valuable time that we barely have. The ICP-PR Bee Protection Group is fortunate to have

a membership that recognizes and advances high quality science toward understanding and addressing factors associated with bee losses. Similar to the current human pandemic, now is the time that we need to undertake activities that advance our understanding and which can be used to develop and implement science-based solutions.

There is a saying "*Tust Du nichts, tut sich nichts*" that translates to "*if you don't act, nothing will happen*". This adage underscores that each of us has a shared responsibility to contribute toward shaping this world of today and providing a solid basis for a future.

In this respect and in our focus area we need to ensure that we find the best, most accurate and most appropriate measures for bee health and population abundance by examining the wide spectrum of direct and indirect sublethal to lethal effects. Every new proceedings of the ICPPR Bee Protection Group underscores the commitment of this organization and its constituency to high quality science.

Over the years, the ICP-PR has played a critical role in helping to advance the science to both qualitatively and quantitatively assess the factors affecting declines in bee health. Global issues such as the declines in bee health can best be addressed collectively through effective communication, cooperation and collaboration, which have been hallmarks of the ICP-PR.

As with the symposia leading up to it, the 14th Symposium in Bern was a resounding success. Thanks to the authors, scientific findings on a very wide range of relevant aspects are presented in the proceedings, such as numerous experimental advancements, methodological improvements, results of ring testing validation efforts, experiences with new guidance and guidelines. Numerous works investigate the importance and assessment methods for different exposure routes, refinements in the conduct y conduct and assessment of studies, and identification of most relevant endpoints.

There has been a clear focus on the development of test methods for non-Apis bees that has resulted in development of several test guidelines. Similarly, new working groups, such as the microbial [pesticide] working group, work on investigating the state of art and possible advances for which cases testing and risk assessment strategies are appropriate.

Furthermore, studies that consider field-realistic application techniques and farming procedures, and also residue measurements, residues in bee products and monitoring results as well as strategies and suggestions for risk assessment strategies are presented.

To sum it up- we hope we have triggered your interest to read the full proceedings, and that you enjoy the scope of topics and articles. Thanks again to all the authors, and to all of you who make the ICPPR Bee Protection Group a global forum that concentrates on high quality science.

We hope to see you in best health in October 2021 in York or before!

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Disclaimer: Any views/opinions expressed in any of the papers/abstracts/posters do not necessarily reflect the constituency of the ICP-PR Bee Protection Group nor of the Bee Protection Group board.