General News

Non-target Effects of Invertebrate Control Agents

The news section this issue is short to free-up room in the printed journal for a major review of direct and indirect non-target effects of invertebrate biocontrol agents.[1] The authors discuss parasitoids and predators, and tabulate information on 158 species of parasitoids introduced worldwide in 1985–2015. Emerging trends are identified: in the most recent ten-year period, there was a shift towards genus- or species-level specificity, while previously almost half of introduced species were specific at, or above, family level.

This article has been reprinted in a different format (and with colour photos) as a US Department of Agriculture – Forest Service FHTET Bulletin, available free of charge from Richard Reardon (email: rreardon@fs.fed.us). The information relating to North America and US overseas entities is also being expanded into a 'Julien-type' printed catalogue of first releases of new species of parasitoids and predators for classical insect or mite control in North America; this will include source location for the agent, literature and host-testing information on host range, and published information on establishment and impact. The catalogue will also be available online, and this version will be updated/corrected with a completion date for the project of 2019.

A session on 'How well do we understand non-target impacts in arthropod biological control', organized by Mark Hoddle and Roy Van Driesche, is part of the Fifth International Symposium on Biological Control of Arthropods (ISBCA 2017) in Malaysia. The symposium proceedings will be published as an open access e-book by CABI, with a provisional publication date of 1 September 2017, in advance of the conference on 11–15 September.

[1] Van Driesche, R. and Hoddle, M. (2016) Non-target effects of insect biocontrol agents and trends in host specificity since 1985. *CAB Reviews* 11, No. 044.

The remainder of this short section focuses largely on projects and resources pertinent to non-target testing in this group of biocontrol agents, including related regulatory matters.

CBD COP XIII Decision

The precautionary approach to biological control, first adopted in Decision VI/23 by the Convention on Biological Diversity (CBD) in 1992 at the Sixth Meeting of the Conference to the Parties (COP VI), was reaffirmed at COP XIII (Mexico, December 2016) in Decision XIII/13. This new Decision encourages application of 'the precautionary principle and appropriate risk analysis' when using classical biological control against invasive alien species, and consideration of 'using native species where possible'. The Decision calls for tools, including decision-support tools, to be adapted, improved or further developed to improve biological control, and for relevant information to be made available through the CBD's clearing-house mechanism. It further asks for collaboration with relevant bodies 'to identify options for supplementing risk assessment and risk management standards' with the ultimate aim of considering this at COP XIV. The CBD issued a call in June (deadline 30 September 2017) for information relating to questions raised in the Decision. For further information see: www.iobc-global.org/news_20170619_Ivasive_Alien_Species.html

New Zealand: the PRONTI system

Introduction of biocontrol agents to New Zealand comes under the Hazardous Substance and New Organisms (HSNO) Act 1996. In response, scientists have devised PRONTI: the Priority Ranking of Non-Target Invertebrates decision-support system. This automated system comprises (i) a database of published information for the proposed entomophagous agent and non-target species, including potential for interactions, and (ii) a model that prioritizes species for testing (including uncertainty about a species' ranking). Publications show how the tool has been validated for *Polistes chinensis* as a hypothetical biocontrol agent in kiwifruit orchards[1], and applied to select species for host testing against *Cotesia urabae*[2]. These papers discuss PRONTI's advantages including its reliability in identifying key non-target species.

[1] Todd, J.H., Barratt, B.I.P., Tooman, L. and Malone, L.A. (2015) Selecting non-target species for risk assessment of entomophagous biological control agents: evaluation of the PRONTI decision-support tool. *Biological Control* 80, 77–88.

[2] Todd, J.H., Barratt, B.I., Withers, T.M., *et al.* (2017) A comparison of methods for selecting non-target species for risk assessment of the biological control agent *Cotesia urabae*. *BioControl* 62, 39–52.

Improving Classical Biological Control in the USA

A recent paper in *Biological Control* identifies regulatory, political and institutional obstacles that are impeding classical biological control programmes in the USA.[1] This note focuses on how these obstacles impinge specifically on host-specificity testing; other topics are of course dealt with fully in the paper.

The authors call for transparent criteria to prioritize invasive species for biological control, including for determining relevant and important non-target species for testing. They identify a continuing funding shortage that hampers, among other activities, pre-release screening and post-release monitoring, and suggest how increasing the scope of biological control could lead to novel funding sources. They suggest introducing defined timeframes to overcome cumbersome regulatory procedures and long timelines that currently hamper approval and release of new biocontrol agents; as part of this, they argue that risk–benefit analysis needs to be integrated into the decision-making process, and communication improved between decision-making bodies and petitioners. They also suggest that federal and state permitting requirements are reviewed. Lastly, they suggest that the 'environment' community's concerns about introducing non-native species should be addressed by improving cooperation – at all stages of biological control projects – between agencies that deal with the environment and with biological control.

[1] DiTomaso, J.M., Van Steenwyk, R.A., Nowierski, R.M., *et al.* (2017) Addressing the needs for improving classical biological control programs in the USA. *Biological Control* 106, 35–39.

BINGO: Monitoring and Risk Assessment

The Marie Skłodowska-Curie Innovative Training Network project BINGO (Breeding Invertebrates for Next Generation BioControl) includes research into sustainable and efficient use of biocontrol agents. As part of this, Work Package 5 is using two model systems to examine benefits and risks of using native parasitoids for augmentative biological control. The invasive pest *Halyomorpha halys* and the parasitoid *Anastatus bifasciatus* (which has adopted the pest as a novel host) are being used to investigate the impact of inundative releases of large numbers of a polyphagous native biocontrol agent on non-target species. *Halyomorpha halys* is notably a pest of fruit trees in Europe. Laboratory testing of species selected on the basis of parameters including taxonomic relatedness to *H. halys*, phenology, egg size and likely presence in orchards indicated that development could be completed in 23 of 28 species tested, including Heteroptera and Lepidoptera. Initial results under field conditions in a Swiss orchard where c. 1000 parasitoids were released indicate that attack on 'sentinel' egg masses of three selected non-target hosts was far less than on *H. halys* egg masses; the work is continuing, with more inundative releases planned for apple orchards. Research has also begun on monitoring the competitive effects of inundative releases of *Trichogramma brassicae*, a polyphagous parasitoid of Lepidoptera, on naturally occurring *Trichogramma* populations.

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Web: www.bingo-itn.eu/en/bingo.htm

Harmonizing Regional Regulation of Invertebrate Biological Control

The North American Plant Protection Organization (NAPPO) published the first regional standard specifically aimed at invertebrate biological control in 2000, and a revised version was published in August 2015.[1] North American expertise and the common approach developed by NAPPO is useful for other regions to draw on, as indicated by the Joint EPPO/COST-SMARTER Workshop on the Evaluation and Regulation of the Use of Biological Control Agents in the EPPO [European and Mediterranean Plant Protection Organization] Region in Budapest in November 2015 (see *BNI* 37(1), March 2016). *EPPO Bulletin* has been publishing outputs from this workshop, including a paper indicating how Europe could learn from and adapt the North American experience (see also *BNI* 38(2), June 2017).[2,3]

[1] NAPPO (2015) *Regional Standards for Phytosanitary Measures (RSPM) 12. Guidelines for Petition for First Release of Non-indigenous Entomophagous Biological Control Agents*. Secretariat of NAPPO, Ottawa.
Web: www.nappo.org/files/1814/4065/2949/RSPM12_30-07-2015-e.pdf

[2] [Various authors] (2016) *EPPO Bulletin*, 46(2), pp. 239–289.
Web: http://onlinelibrary.wiley.com/doi/10.1111/epp.2016.46.issue-2/issuetoc

[3] Mason, P.G., Everatt, M.J., Loomans, A.J.M. and Collatz, J. (2017) Harmonizing the regulation of invertebrate biological control agents in the EPPO region: using the NAPPO region as a model. *EPPO Bulletin* 47, 79–90.

EMPHASIS on Regulation

The EU project EMPHASIS (Effective Management of Pests and Harmful Alien Species – Integrated Solutions) published a White Paper in September 2016, also as an output of the 2015 EPPO/COST-Smarter Workshop.[1] The paper aims to demystify the regulatory environment that stakeholders wanting to introduce a biocontrol agent to the EPPO region need to navigate. While written from a European perspective, the paper provides a good account of the complications encountered when biocontrol agents come under regulations designed for other categories such as invasive species, plant pests and plant protection products. It provides an overview of global agreements and standards as well as EU legislation and how this applies to biocontrol agents.

[1] EMPHASIS (2016) *The Regulatory Framework for Biological Control Agents*. White Paper. 8 pp.
Web: www.emphasisproject.eu/upload/deliverables/file/White_Paper_2710.pdf