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70 YEARS OF BIOLOGICAL CONTROL OF RABBITS IN AUSTRALIA – AN ONGOING CO-EVOLUTIONARY ARMS-RACE

par
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European rabbits remain one of the most damaging environmental and agricultural pests in Australia. Self-disseminating viral biocontrol agents have proven to be the only effective means of continental-scale rabbit control. The two rabbit specific pathogens myxoma virus (MYXV) and the calicivirus rabbit haemorrhagic disease virus (RHDV) were deployed as biological control tools in the 1950s and 1990s, respectively, resulting in savings exceeding $70 billion AUD to the agricultural industries over 70 years. In addition, the sustained landscape-scale reduction of rabbit numbers and impacts has allowed many fragile ecosystems to partially recover from the devastating impact of rabbits. In addition, the point releases of the two biological control agents into a largely naïve population has also provided a unique opportunity to study the initial spread and establishment of emerging pathogens and the co-evolution with its host.

In contrast to MYXV, which attenuated shortly after its introduction and has become the text book example for the trade-off hypothesis of virulence evolution, rapid attenuation of RHDV has not been observed. Instead, RHDV appears to be evolving towards maintaining very high levels of virulence to maximise insect transmission from virus-laden carcasses rather than diseased animals. This notwithstanding, genetic resistance to RHDV has been described in some rabbit populations and rabbit numbers have again started to recover, although not to the plague proportions of the 1930s.

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