



YOUNG SCIENCE COMMUNICATORS COMPETITION 2016/2017

ARTICLE CATEGORY

WINNER

The Harlequin Ladybird: The Bad Side of a Cute Beetle

Ladybirds are often portrayed as the darlings of the insect world, featuring in many children's poems and story books. However, all is not as it seems. Behind the cute façade is one of the world's most damaging invaders.

There are many hundreds of ladybirds in South Africa (some only a millimetre in size), but the ladybird you are most likely to come across in your garden is the harlequin ladybird, *Harmonia axyridis*, a globally invasive beetle native to Asia.

This ladybird was introduced to multiple locations across the world either intentionally as a biocontrol agent against pest aphids, or unintentionally by way of imported goods. This globetrotter has now spread into natural habitats on all continents except Australia and Antarctica with, as yet, no effective methods to curtail its colonisation. We do not yet know the exact pathway of introduction of this beetle into South Africa (although it was most likely from uninten-

tional introductions), museum records show that it was present in the Cape Town area in 2001. It has since rapidly spread across most of the country, currently occurring in all nine provinces.

Many species that are introduced to new regions fail to establish and spread. So, what makes this ladybird such a ferocious invader? To start with, they are large and aggressive, giving them the edge during conflicts with other ladybirds, often eating their opponents in the process. They lay thousands of eggs over their lifetime, so they can quickly increase their population numbers. Their broad diet of fruit, pollen, nectar and other insects means they are hardly ever without sustenance, yet they are also able to go without food for long periods of time. They are good fliers, allowing them to quickly spread and cover large distances. They also have a strong immune system; they may even be carriers of a biological weapon of sorts: they seem to be unaffected by a parasite they carry that kills

By Ingrid Minnaar

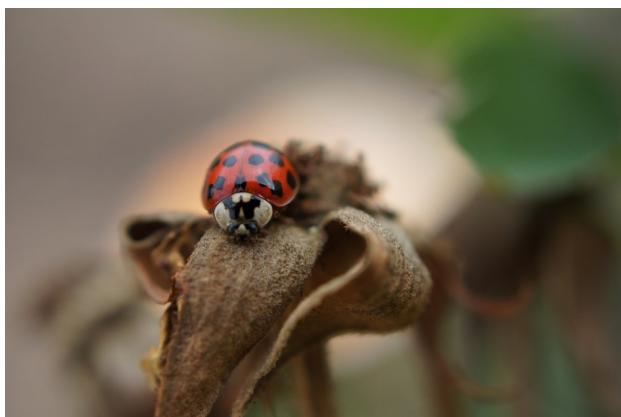
Ingrid Minnaar is currently completing her PhD at the Centre for Invasion Biology, at the University of Stellenbosch.

This is what she says:

"I was always a very curious person; constantly wanting to figure out how stuff works, and why they work the way they do. I was also totally enchanted by David Attenborough's nature documentaries as a child and soon realised that I needed to study biology in order to satisfy my curiosity and love for nature. I did my undergraduate, honours and M.Sc. degrees in zoology at the University of Pretoria. For my honours' project, I worked on the feeding behaviour of Madagascan giant day geckos and, for my masters, I studied the thermal physiology of Wahlberg's epauletted fruit bats. Towards the end of my masters, I developed a keen interest in thermal physiology and I knew I wanted to continue in the field for my Ph.D., specifically, how species respond to climate change effects. So, when I came across a project advertised by Prof. Susana Clusella-Trullas at the Centre for Invasion Biology, Stellenbosch University, about the thermal physiology of invasive and native ladybirds, I jumped at the opportunity. I am currently writing up my Ph.D. dissertation, and plan to pursue a career in academics."

native ladybirds. Most importantly perhaps, they can adjust their traits in a very short time period depending on their environment. For example, they are able to increase the temperature they can tolerate if they are exposed to a warm environment for a short period of time.

Why should an insect no bigger than a Jellytot concern you? Well, whereas the damage a single harlequin ladybird can cause is quite substantial, they can wreak havoc when they form large groups. By cannibalising native ladybird eggs, larvae and pupae, the harlequin ladybird has become the leading cause of native ladybird decline in the UK. In North America and the UK, it damages soft fruit in orchards, and causes the loss of millions of dollars of wine in the US by releasing a bitter substance when agitated during harvest, tainting the wine in the process. During winter they form large aggregations, secreting the same bitter substance which stains buildings, furniture and clothes yellow. They



have also been known to bite people and cause allergic reactions such as asthma.

We do not yet know what impact the harlequin ladybird is having in South Africa, but if North America and the UK are anything to go by, we should be keeping a close eye on it.

A citizen science initiative with the aim to educate the public about this species, gather distribution records and collect specimens across the country has been started by the CL.I.M.E lab at the Centre for Invasion Biology at Stellenbosch University (<http://invasives.org.za/component/k2/item/1239-harlequin-ladybird-citizen-science-project-launched>). These data will be used to determine pathways of introduction, dispersal rates between geographic regions, and test hypotheses of invasion history using molecular techniques, thereby greatly informing management policies. You can also upload your photos of this species, along with the date and location of your snapshot, to iSpot.

*The harlequin ladybird, *Harmonia axyridis*, is one of the world's worst invasive insects. It can be distinguished from other ladybirds by the black 'M' or 'W' on its neck (i.e. the pronotum). The number of black spots on its body can vary from 0 to 20, and it can range in colour from light orange to dark red. It is between 0.5 and 1 cm in size. © Ingrid A. Minnaar*

ABOUT THE YOUNG SCIENCE COMMUNICATORS COMPETITION

The South African Agency for Science and Technology Advancement (SAASTA's) Young Science Communicators competition is an initiative that aims to encourage young scientists to communicate their world to the public, beyond their academic peer community.

It is one of a number of initiatives at SAASTA aimed at developing science communication skills in scientists and researchers.

The competition awards four categories, namely: popular article; video clip; audio clip; and an open category. Participants are encouraged to explore their creativity in communicating their work.

For more information visit www.saasta.ac/competitions/young-science-communicators

These entries are the original submissions of the participants and have not been edited or adjusted by SAASTA



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