

# ON GUARD AGAINST AN ALIEN INVASION

*Aliens in Antarctica!* It sounds like a science fiction thriller. But in fact, *Aliens in Antarctica* is the first major investigation into the effect of human activities in Antarctica on the invasion potential of alien (non-native) species.

The International Polar Year project is examining the type and amount of 'propagules' (seed, spores and eggs) that are unintentionally imported into the region on clothes, shoes or hand luggage, as well as how many propagules are likely to be deposited and whether they will germinate and grow.

Co-Chair of the project, Dr Dana Bergstrom of the Australian Antarctic Division, says the impact of alien species could range from a minor, transient introduction, to a substantial loss of local biodiversity and changes to ecosystem processes and evolution.

Building on an Australian pilot study conducted a few years ago by Dr Jennie Whinam, Nicki Chilcott and Dr Bergstrom – which found an

array of propagules like grass and other seeds, moss spores, plant fragments and soil particles that could potentially hitch-hike to Antarctica on travellers' belongings – an international team of scientists from nine nations has assembled to investigate the size of the problem across the Antarctic region, with over 20 Antarctic nations participating.

This recent Antarctic season saw passengers from over 40 ships and planes participate in a survey of where they had travelled to in the last 12 months. The outdoor clothing and belongings of some expeditioners and tourists were also sampled with special vacuum cleaners, to find any propagules. These data will be analysed over coming months, providing the first snapshot of the threat of alien species introduction posed by humans entering Antarctica.

The Australian team examined over 2000 items of fresh fruit and vegetables destined for Australian Antarctic stations. Eighty-nine per cent of these items were clean, while most of the remaining 11% were being spoilt by blue moulds (*Penicillium sp.*). Cargo destined for Antarctic stations was also examined over the same period, with some interesting discoveries.

'We found live springtails and mites in packaging material that was on its way to Antarctica. The material was scheduled to be fumigated, but it demonstrates how important it is to be vigilant in these situations,' Dr Bergstrom says.



Although most fresh fruit and vegetables destined for Australian Antarctic stations were free of propagules, a few were found to be rotting, such as these pears and onions.

'Discoveries like this give us an insight into the pathways by which existing alien species might have been introduced into the Antarctic region. There are springtail colonies on some of the sub-Antarctic islands and records of *Penicillium* in soils at Casey that may have been introduced through a similar pathway, before our quarantine procedures were so well established.'

The project team is complementing this real-world work with laboratory-based simulations. In one, seed has been sown on different mediums such as sand, peat and gravel, and at different temperatures, to see what may germinate and grow in the dry, cold Antarctic conditions.

Another simulation involved a team of volunteers play-acting as tourists, using clothing and equipment that had been impregnated with seeds, to test the likelihood of propagules being deposited during a typical tourist visit to a region.

With rapid climate change occurring in some parts of Antarctica, greater numbers of alien introductions and more successful invasions by aliens are likely, with consequent increases in impacts on ecosystems.

The Aliens in Antarctica project provides the first opportunity to assess the absolute size of the threat of alien propagule transfer to the Antarctic region through human activity.

'Once the threat is established, we can formulate appropriate methods to combat the risk,' Dr Bergstrom says.

'Data and information gathered during this project will be reported to the Antarctic Treaty Nations and used to improve conservation and protection practises in the Antarctic region and other sensitive areas around the world.'

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**More information:**  
[www.aliensinantarctica.aq](http://www.aliensinantarctica.aq)



As part of the Aliens in Antarctica project an experiment was set up to determine the likelihood of propagules, attached to clothing, being deposited in Antarctica. Here ABC Catalyst presenter Paul Willis has his boots laced with seeds by Dana Bergstrom, before walking through a patch of sand to simulate tourist activities in Antarctica.