Surveys of indigenous entomopathogenic fungi and nematodos of Chile and studies on their pathogenicity towards pests of economic importance.

Loreto Merino[1], Steve Edgington[2], Dave Moore[2] and Andrés France[1].
1 INIA (Quilamapu), Avenida Vicente Méndez 515, Chillán, Chile.
2 CABI Europe – UK, Silwood Park, Buckhurst Road, Ascot, Berkshire SL5 7TA, UK. s.edgington@cabi.org

ABSTRACT

This 3 year project is funded by the Darwin Initiative, with the aim of creating a national database of entomopathogenic fungi (epf) and nematodes (epn) found within Chile and to build on the expertise required to curate and profile them. The long-term objective is to develop biological control agents based on these microorganisms and to highlight the benefits of conserving microbial diversity to local growers. The project is a collaboration between CABI (Europe - UK) and the Instituto de Investigaciones Agropecuarias (INIA) in Chile.

SURVEY SITES

Six sites have been selected in Chile (Figure 1), each of which will be surveyed for epf and epn.

The sites, stretching from the Andes to the Pacific coast, cover some of the major topography, vegetation, soil types and climates present in Chile, from hot, arid desert in the north to near Antarctic conditions in the south. Two surveys were carried out in Year 1, in the north and south of the country.

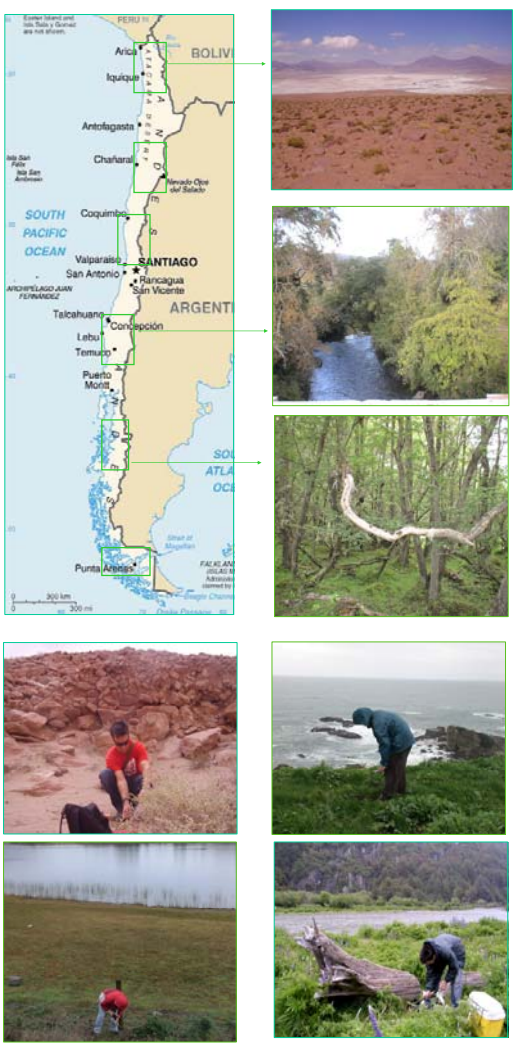


Figure 1. Designated survey sites (Year 1 surveys, arrowed)00

SAMPLING

Approximately 200 soil samples were taken in each survey site, collecting from a variety of ecosystems including agricultural land, coastal platforms, salt lakes and the Tamarugal Pampa. Samples were also taken on Isla Magdalena, a national park 2 km off the west coast of Chile. The altitude of sampling points ranged from 0 to 4800 m above sea level.

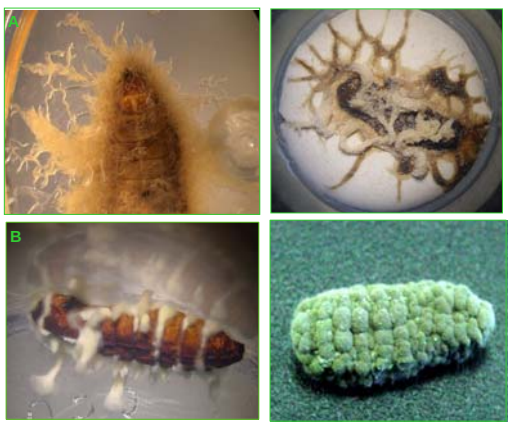


Figure 2. Waxmoth larvae infected with A.entomopathogenic nematodes (EPN) and B. Entompatogenic fungi (EPF).

At each soil sample site the pH, temperature and humidity of the soil was taken, then the samples returned to the INIA laboratories. Processing for epf and epn used waxmoth larvae as bait and was carried out twice for 4 days at 20 ˚C (Figure 2). Two more sites will be surveyed in Year 2, with the final two in Year 3.

ISOLATES

Processing of samples has presently revealed 15 epn isolates (*Steinernema* and *Heterorhabditis* spp.) and 140 epf (*Metarhizium* and *Beauveria* spp.) (Figure 3). Isolates are in process of molecular identification, cryopreservation and will then be biologically and ecologically profiled to identify links between habitat and isolate.

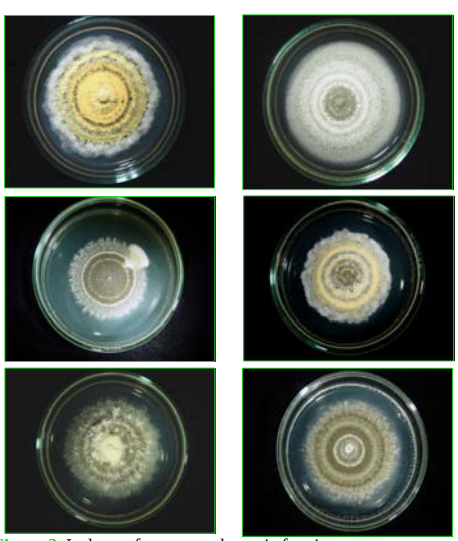
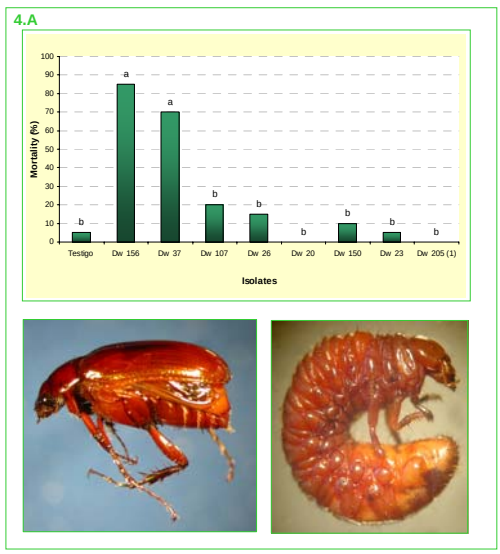


Figure 3. Isolates of entomopathogenic fungi.



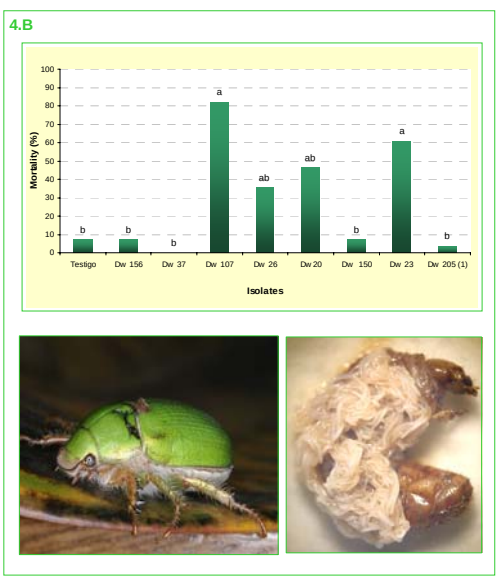


Figure 4. Example of NEP screening on important target pest show the variability of different isolates, like the parasitism in *Sericoides virides* (Figure 4.A) and *Hylamorpha elegans* (Figure 4.B).

INIA will be working in Chile to establish a “use” plan for epf and epn as biological control agents and to publicise both the project and the value of indigenous microorganisms). The new collection, together with the profiling information will be valuable in Chile’s search for alternatives to chemical pesticides.

ACKNOWLEDGEMENTS: This project is funded by the Darwin Initiative (www.darwin.gov.uk), a grants programme administered by the UK Department for Environment, Food and Rural Affairs (DEFRA).