Environmental Protection Authority
Te Mana Rauhī Taiao

PROPOSAL FORM

Proposal form to prescribe certain organisms as not new organisms

for the purposes of the Hazardous Substances and New Organisms (HSNO) Act

Send to the Environmental Protection Authority preferably by email neworganisms@epa.govt.nz or alternatively by post to: Private Bag 63002, Wellington 6140

Bioforce Limited

Name of person or organisation making the proposal

72 Sim Road, Karaka, RD 1 Papakura 2580, New Zealand

Postal Address

28/09/2016

Date

Important

If species were not present in New Zealand before 29 July 1998, they are classed as new organisms under the Hazardous Substances and New Organisms (HSNO) Act. As such, they will require HSNO Act approval for propagation or distribution of the organism to occur. Currently, if anyone was to conduct any of these activities without a HSNO Act approval they would be committing an offence under section 109(1) of the Act.

To change its “new organism” status (which means that an organism will not be regulated under the HSNO Act), an organism must be deregulated under section 140(1)(ba) of the HSNO Act, by an Order in Council given by the Governor General prescribing organisms that are not new organisms for the purposes of this Act.

As part of this process, the following form is to be filled in by the person or organisation making a proposal to prescribe certain new organisms as not new organisms.

The information provided in this form will be used in the decision-making process (which is likely to include a public consultation component). Any confidential information must be clearly labelled and included as a separate Appendix.

1. Details of the new organism(s) proposed to be prescribed as not new organism(s)

Please complete this section for each organism proposed to be prescribed as a not new organism.

Name of organism

Cybocephalus sp indet (as per voucher specimen deposited in PANZ, Auckland, New Zealand Voucher code: T12_03094).

Why do you want to prescribe this organism as "not new"?

Including:

- Is there any information on the economic or environmental impacts of the organism?
- What is the benefit of making this organism "not new"?
- Can these benefits be quantified?
- Can these benefits be achieved by alternative means?

Cybocephalus sp indet is a member of predatory beetles in the family Cybocephalidae. These organisms prey on plant pests and often are specialists for armoured scale insects but some species predate whiteflies, mealybugs and mites. The species, found in New Zealand, has been found associated with whitefly including the Australian citrus whitefly *Orchamoplatus citri.* High populations of this pest cause damage to citrus plantings in New Zealand and this whitefly not well controlled by natural enemies here. *Cybocephalus* could be a useful control agent for this pest in citrus.

As the organism has not been researched in New Zealand there is no definitive information on economic or environmental impacts of this beetle in our environment.

Pest whitefly continue to cause serious damage to many local crops and effective natural enemies are scarce. Biological control is the only sustainable option for pest whitefly management. Consideration must be given to survival of endemic whitefly species but it is possible with this predatory beetle that significant population development requires large numbers of prey as can be found in citrus from time to time and endemic species on other host plants may be less attractive.

Making this organism "not new" enables meaningful real-world assessment of insect behaviour can be carried out in the local environment and this data can inform on management options now that the beetle is established here.

Describe the biology of the organism

Including:

- What are the biological characteristics of the organism?
- Where is it found overseas?
- Does it cause a disease?
- Does it have potentially beneficial characteristics?
- What adverse effects could making this organism "not new" have on people or the environment, if any? Can these be quantified?

Biology of the *Cybocephalus* species found in New Zealand has yet to be confirmed in detail but as the beetle has been associated with whitefly populations, there is value in knowing about the biology of a species with similar characteristics found in Australia. Details can be found in a recently published factsheet: Martin NA. 2017. Citrus whitefly predator - *Cybocephalus* species 1. Interesting Insects and other Invertebrates. New Zealand Arthropod Factsheet Series Number 115.

This document is available online at:

https://nzacfactsheets.landcareresearch.co.nz/factsheet/InterestingInsects/Citrus-whitefly-predator---Cybocephalus-species-1.html

These notes about host associations and life stages are based both on observations in Auckland and published details of biology of *Cybocephalus aleyrodiphagus* in Australia by Alexander Kirejetshuk and colleagues in 1997 (Kirejtshuk AG, James DG, Heffer R. 1997. Description and biology of a new species of *Cybocephalus Erichson* (Coleoptera: Nitidulidae), a predator of Australian citrus whitefly. Australian Journal of Entomology 36: 81-86.).

Information on the beetle is reproduced below for convenience:

"This tiny Citrus whitefly predator overwinters as adults. In Australia they lay eggs close to eggs of Citrus whitefly. The larvae feed on eggs and whitefly larvae. The mature larvae spin a cocoon, which on citrus trees, is covered with egg shells and empty shells of larvae and puparia. There are two generations per year in New South Wales and that appears to be the same in Auckland. The adults also feed on eggs and juvenile whiteflies.

The adults are tiny, about 1 mm long. The body is brown. In the male, the head and front of the pronotum (the first thoracic segment after the head) are yellow. The upper side of the body and elytra (wing covers) are covered in fine punctures. The colour of the underside is similar. The three pairs of legs and the pair of antennae are yellow-brown.

The eggs of the species in Australia are elongate, pale coloured and laid singly. The white larvae are covered with setae (hairs). As the larva grows it moults (changes skin). The number of larvae instars (stages) is not known. The mature larva is over 2 mm long. It spins a cocoon that may be covered with whitefly eggs and larval skins. It pupates in the cocoon. The pupa is creamy white. Just before the emergence of the adult, dark eyes can be seen.

Walking and flying

Both adult and larval stages of this beetle have three pairs of legs that can be used for walking. Adults have wings and can fly.

Feeding

The adult and larvae of the Citrus whitefly predator eat eggs and juvenile whitefly. The jaws are the primarily structures used for holding and chewing the prey. Legs do not appear to be used for holding food."

Other beetles in the family Cybocephalidae are found in tropical, sub-tropical and temperate regions of the world.

It is unlikely that this organism would cause disease and reports of diseases caused by Cybocephalidae are unknown.

Cybocephalus sp. are valued as natural enemies of plant damaging scale insects in many countries and mass reared commercially and distributed in North America for use as biological control agents.

Adverse effects of making this organism 'not new' are very unlikely for people in New Zealand and also unlikely for our endemic whitefly in the environment as there are no reports of exceptionally high predation elsewhere.

Has the organism formed a self-sustaining population in New Zealand?

Including:

- Where has population(s) of the organism been found in New Zealand?
- How does this organism spread?

Cybocephalus sp. was first found in New Zealand in December 2011 feeding on Australian citrus whitefly, *Orchamoplatus citri* (Hemiptera: Aleyrodidae) on a lemon tree in Auckland. Further specimen were collected in June 2012, from the same location indicating a persistent established population at least at that site. Since April 2013, more observations have been made across the Auckland region and posted on the public forum Nature Watch (www.naturewatch.org.nz).

As there has not been specific surveys carried out and with the small size of the beetle, current spread is unknown and its presence most probably goes un-noticed. Plant hosts are varied and include woolly nightshade *Solanum mauritianum* in addition to host plants recorded on Landcare Research website.

Dispersal mechanisms have not been researched either but as adult beetles can fly and food is relatively abundant year round, this organism would be expected to spread steadily over time. Movement of plants hosting *Cybocephalus* and adults hitch-hiking on vehicles could facilitate significant extensions to geographical range.

Is any person attempting to manage, control or eradicate the organism under any Act or is the organism the subject of an enforcement action or action under a civil penalty regime?

Including:

- If the organism has been part of an official incursion response or other MPI (MAF) response or management activity, describe what happened here including why the response was stood down.

No attempts to manage this organism are known.

The local species of *Cybocephalus* has been continually sighted and recorded in the Auckland area for the past six years. One species in the genus, *Cybocephalus rufifrons*, is included on the MPI list of Unwanted Organisms (UOR) but the only species of *Cybocephalus* present in New Zealand shares similar traits to an Australian species, *Cybocephalus aleyrodiphagus* Kirejtshuk, James &Heffer, 1997, that feeds on Australian citrus whitefly (Nicholas Martin, 2017).

It is reasonable to now assume that the local species is genetically different from that on the UOR for several reasons:

1) There has been sufficient time to confirm similarity with *C.rufifrons*.
2) There has been no incursion response or management activity for the *Cybocephalus* species on the UOR.
3) Prey range is different between the two species. *C. rufifrons* is a scale insect predator whilst the local species is clearly a whitefly predator.

Is there reason to believe that this organism was deliberately imported in contravention of an Act of Parliament? If so, please explain.

There is no evidence or suggestion to date that this organism was deliberately and illegally imported into New Zealand.

Any other information you wish to include?

2. References (if applicable)

Martin NA. 2017. Citrus whitefly predator - *Cybocephalus species 1*. Interesting Insects and other Invertebrates. New Zealand Arthropod Factsheet Series Number 115.

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Kirejtshuk AG, James DG, Heffer R. 1997. Description and biology of a new species of *Cybocephalus* Erichson (Coleoptera: Nitidulidae), a predator of Australian citrus whitefly. Australian Journal of Entomology 36: 81-86.