

Summary and review of consultation responses

A consultation was held on the proposed release of the non-native biological control agent, *Aculus* sp. (eriophyid mite), into England to reduce the vigour of *Crassula helmsii* (Australian swamp-stonecrop), which is a widespread and invasive non-native aquatic weed.

In summary, there were 14 responses to the consultation. Nine contributors were supportive of release, two had further concerns, two contributors did not feel they could provide a view, and one contributor had already provided comments during the peer review process.

In response to the specific concerns raised:

Q Given that *Aculus* sp. could spread through a number of routes (wind, members of the public and through accidental spread), monitoring of *Aculus* sp., particularly around *C. aquatica* would be highly recommended.

As *Aculus* sp. reduces the fitness of *C. helmsii* rather than eliminating it, *Aculus* sp. may have long term persistence and spread in the environment. Given that, the suggestion for a medium term monitoring programme should be reviewed.

In addition, steps to control *Aculus* sp. should be considered if non-target impacts are identified through monitoring.

A CABI have put together a draft release and monitoring plan for the release of the mite at 3 sites in England, which has been commented on by Defra. This plan will be regularly reviewed, including any considerations relating to *C. aquatica*.

Q Section 1.08 of the report says "A mite taxonomist has confirmed that morphologically the mite is distinct from any other mite species known from the *Aculus* genus." We are concerned that the identity of this mite isn't yet confirmed. Without the species being described it will be impossible for others to check the identity of any specimens considered for release.

A The species has now been named and described, and will shortly be published in the Journal Zootaxa.

Q It's a great shame that the mite doesn't attack the submerged form of *Crassula helmsii*. The mite may be able to successfully control *Crassula* in the riparian zone, but the aquatic parts of the population would escape its influence and continually recolonise the zone above the waterline.

A This concern is shared by Defra, those involved with the peer review process and many contributors to the consultation. However, Defra acknowledges that small reductions in growth may be useful when attempting to control the weed as part of

an integrated management approach. Given the minimal risk the mite poses to the environment, the concern over its efficacy should not preclude its release.

- Q** The feeding test with *Crassula aquatica* (which is known only from a single site in NW Scotland and is rated as Vulnerable in the UK Red List) showed slight damage in 2 of 22 replicates (9% of samples). What are the confidence limits for this test? We feel that more testing is needed, as there is potential for causing the extinction of *Crassula aquatica* from Britain, especially as *Crassula helmsii* is now present in the north of Scotland.
- A** Although feeding was noted on *C. aquatica* in no choice tests, this was very minimal and plants grew out of the damage within a few weeks. Further, only a small number of eggs were laid on *C. aquatica*, which failed to develop into adults, and damage and egg laying did not occur in choice tests. Because of the small amount of trace feeding, *C. aquatica* was tested more thoroughly, and Defra considers this amount of testing to be sufficient in showing that there is a low risk of the mite feeding on *C. aquatica* in the field, particularly when the specificity of eriophyoid mites is taken into account.
- Q** Some priority ratings in Table 1 (the Test Plant list) are questionable. Three Red List species - *Crassula aquatica*, *Hydrocharis morsus-ranae* and *Saxifraga hypnoides* - are given a rating of 1; *Luronium natans* (Habitats Directive Annexes II and IV) and the Red List species *Damasonium alisma* are given a rating of only 2. All these plants warrant a priority rating higher than that for common plants such as *Typha latifolia* and *Potamogeton crispus*.
- A** Even though different ratings are given to these plants, they were all tested in the same way, with the exception of *C. aquatica*, where significantly more replicates were used. Defra considers the amount of testing on these different species to be sufficient.

The full responses of each contributor are below:

Supportive of release

Response 1

Some species like Japanese knotweed, floating pennywort and giant hogweed cause us serious operational issues daily, impacting the use of our waterways. *Crassula helmsii* is present in a number of our reservoirs and some of our canals. We welcome the proposed release of the *Aculus* sp. Mite to try and reduce the vigour of infestations, which will allow us to work with partners to find other complimentary control measures. While the mite will not infest submerged plants, its impact upon terrestrial/emergent material will be beneficial around our reservoirs and waterway edges. We have confidence that the various testing procedures for this mite were robust and thorough, and recognise that there are many variables with biocontrol. Therefore, the mite's impact in the field may not follow lab test, but we are confident that the species is host specific and will have a

positive impact where it establishes. We would welcome an active release program and can offer multiple sites as receptors. We would also welcome the further development and licence to release of other biocontrol agents, such as the weevil in current tests for the control of floating pennywort. We will continue to work with Defra and partners on Invasive Non-native Species control and eradication and look forward to seeing the positive result of this mite on our waterways.

Response 2

Thank you for your email regarding the risk assessment for the release in the UK of the *Aculus* spp. mite, and its potential for reducing the vigour and spread of *Crassula helmsii* (Australian swamp-stonecrop). We're very interested in any techniques or methods that could be added to the existing armoury that can be used to control and eradicate this problematic pest species. We also welcome the opportunity for a biological control agent that is effective against *Crassula helmsii* as this could mean we don't have to resort to chemical control, e.g. herbicides, which will cause problems in terms of ecological harm to other forms of wildlife in those water bodies. We're acutely aware of the increasing pressures on the continued use of chemical herbicides and the need to reduce their use or to restrict their use in certain conditions, especially in or close to water bodies. Having read through the proposals and risk assessment, we do not have any opposition to the proposal to release the *Aculus* mite to assist in managing the spread and damage caused by *Crassula helmsii*, provided appropriate monitoring and evaluation is implemented to assess its efficacy in real-time and real location conditions. We'll be very interested to hear about the outcomes of any release programmes, and whether the mite has long-term potential to control this problematic plant species.

Response 3

I would like to respond to this consultation. I am strongly in support of release of the non-native biological control agent *Aculus* sp. to England.

Crassula helmsii is a significant issue in Norfolk, as well as the wider East Anglia region due to the extensive network of fens, broads, marsh and wetland which represents ideal habitat for this invader. I have experienced first-hand the threat *Crassula* represents to native species and our concerns lie principally in that we currently have no effective method to limit spread once established. Glyphosate and other chemical treatments (i.e. dye/hot foam etc) do not offer the effective control method needed. If caught in the initial stages of invasion, our advice where possible is to fill in the water body and dry out the area through the planting of shrubs. This of course is not appropriate or feasible for all sites and an alternative approach is desperately needed. We are pleased to hear advances are being made in delivery of a biocontrol and we would be delighted to support this wherever possible.

Response 4

We support the proposed release of non-native biological control agent, *Aculus* sp. (eriophyid mite) to reduce the vigour of *Crassula helmsii*, a widespread and invasive non-

native aquatic weed. Our main comment is that we believe there is a risk that the mite is not particularly effective in the field due to only affecting emergent plants and the limited evidence of its effect in the home range.

- The continued spread of the non-native aquatic plant *Crassula helmsii* is of great concern to us. The plant is now widespread and affecting many sites with both ecological and aesthetic consequences. At many sites, its aggressive growth habit is excluding other species, including a number of conservation concern.
- Control of *Crassula helmsii* is currently difficult as mechanical control (cutting, digging out) tends to spread the plant further due to its propensity to break into smaller fragments which readily root elsewhere. Similarly, chemical control is limited in effectiveness as many herbicides have been withdrawn from use in aquatic situations (quite rightly in our view) and those that remain (glyphosate on emergent growths) are not very effective. Therefore the option of a safe and effective biocontrol agent is very attractive.
- The risk assessment presented appears to be comprehensive and documents a process of screening and testing that accord with best practice, as far as we are aware. The list of plant species included within the tests appears appropriate and we are pleased to see that it has been extended beyond those indicated by the phylogenetic method to include aquatic species, which although more distantly related are likely to be exposed to the *Aculus* mite due to their growth form and the fact that they grow in similar places to *Crassula helmsii*.
- We note concerns about the potential for the *Aculus* mite to adapt and therefore survive in colder conditions hence potentially being able to affect the native *Crassula aquatica*. However, we note that the risk assessment reported very limited development of the mite on this plant species and hence agree with the conclusion that there is little risk.
- The biggest concern is that the *Aculus* mite will not prove effective in the control of *Crassula helmsii* in field conditions. We note that the mite only affects emergent parts of the plants and cannot survive underwater. Many sites with extensive *Crassula helmsii* have both submerged and emergent growth forms and the plant is able to persist and then recolonise from both growth habits. Nevertheless, it is possible that even a modest impact on the vigour of emergent plants could reduce some of the ecological impact of *Crassula helmsii* in the UK.

Response 5

Many Trusts have problems with *Crassula* on their reserves and wetland Local Sites and spend significant amounts of money and time attempting to contain it. One Trust commented that the greatest impact was on freshwater invertebrates of the drawdown zone and of ponds and bittern in reedbeds - "*The plant has been devastating and we have been waiting for effective biocontrol.*"

One Trust had tried a similar biological control for Azolla and they were pleased with this result. The difference being the Azolla weevil, although non-native, is already naturalised in the UK. So potential side effects were well known, but this *Crassula* control is not naturalised, so potential unintended consequences are less easy to fathom. This Trust is therefore very keen for a biological control option for *Crassula*, but only if due diligence on the potential downsides has been done. Some guidance on the best time/place to use it would be good, and when not to use it.

Currently, the other options available at present for *Crassula* control that Trusts were aware of are:

- Covering in black plastic for many weeks - thus denying other creatures access to area and also creating an unsightly mess, generating visitor complaints
- Spraying with a plant-based agent in hot water foam solution – requires easy access to the *Crassula* to use the expensive equipment. Also, the plant-based agent obviously puts nutrients into the ecosystem
- Manually pulling it out of the water body. You can't get it all out and can only do small areas; not feasible if you have to pay for labour. Our volunteers enjoy doing it because of the opportunity for water play
- Planting shoreweed (*Littorella uniflora*) allegedly suppresses *Crassula* growth¹.

One Trust feels that the release should take place. They don't think that it will be the answer to all the problems with *C. helmsii* as this release is to reduce its dominance in the sward and in many cases there aren't any species that live where it is currently infesting. Conversely it bare mud that is required at the infestation sites. They would recommend that CABI keep looking for BCAs to see if there are any species-specific agents that would attack the subsurface vegetation.

Response 6

We are supportive of release.

Response 7

We do not feel that the introduction of *Aculus* sp. would have any negative effects on native UK species. *Crassula helmsii* is having a devastating impact on wetlands around the UK, and measures need to be put in place to try and control this highly invasive species. We therefore support the release of *Aculus* sp. in the UK.

¹ Denton, J. (2013) Could shoreweed be useful for *Crassula* control? Conservation Land Management, **11**: 18-19

Response 8

We have been made aware that Defra is currently undertaking a consultation on whether the non-native eriophyoid mite *Aculus* sp. should be released as a biological control agent to reduce the vigour of Australian swamp-stonecrop *Crassula helmsii*.

We have a particular interest in the control of *Crassula helmsii* as this plant has invaded species-rich habitats which are recognised as being of national and international importance through a variety of designations including Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar Site.

We therefore welcome the opportunity to respond to the current consultation.

Thank you for sending me the Pest Risk Assessment (PRA) for *Aculus* sp. nov. ex *Crassula helmsii*. I note that the information and data provided with the PRA and the summary of reviews should not be reproduced or published and should not be distributed more widely.

We cautiously support the release of the eriophyoid mite *Aculus* sp. nov. ex *Crassula helmsii* for the biological control of *Crassula helmsii*.

In reaching this conclusion the following factors have been considered: -

- The possibility of the mite having a detrimental effect on native non-target species;
- The likely effectiveness of the mite as a biological control of *Crassula helmsii*, and
- The need for biological control of *Crassula helmsii*

Possibility of detrimental effect on native non-target species

We note that the eriophyoid mite has been tested against a range of plant species, as listed in Appendix 1 to the PRA, which are either closely related to *Crassula helmsii* or which are grown in similar habitats.

We note that the mite has been tested against a number of native species which are associated with our site, for example *Pilularia globulifera*, Floating Water-Plantain *Luronium natans* and Greater Bladderwort *Utricularia vulgaris*.

We are aware that the eriophyoid mite has been tested against the two closely-related native species of *Crassula* which occur in the UK namely Mossy Stonecrop *Crassula tillaea* which occurs on our site and Water pygmyweed *Crassula aquatica* for which there is only one record in the UK (located in western Scotland) and which is classed as 'vulnerable' in the UK.

We note that the host specificity studies carried out under quarantine conditions demonstrated that there was no significant feeding or development on any of the 40 non-target plant species that were chosen for testing. In no-choice tests the mite was shown to lay eggs and cause signs of trace feeding on *Crassula aquatica* and although one egg

hatched, no further development occurred. In choice tests, no oviposition was recorded, strongly suggesting that in a natural situation *Crassula aquatica* would not be a host for this species of mite.

We note that the PRA concludes that the mite 'will not present a phytosanitary risk to any non-target species as host specificity studies in the laboratory have demonstrated that the mite is highly specific to *C. helmsii*'.

We note that Defra consider the host range testing in the laboratory was thorough and that the minimal amount of trace feeding on one species other than *Crassula helmsii*, when coupled with the specificity of eriophyoid mites in general, reassured Defra that the mite would be specific to *Crassula helmsii* under field conditions.

Likely effectiveness as a biological control of *Crassula helmsii*

Appendix 3 to the PRA focuses on climatic suitability and establishment potential of the mite and concludes that there is 'sufficient evidence to indicate that the mite can establish and spread through most parts of the UK under the current climate' although it is accepted that there would be fewer generations of the mite than in its area of origin where temperatures are higher.

We note that the mites' spread will be facilitated by them being carried on the wind.

The PRA recognises that *Crassula helmsii* can grow in submerged, emergent and terrestrial situations but as the mite 'only colonises emergent and terrestrial growth' only these growth forms of *Crassula helmsii* would be affected.

We commissioned trials into a variety of techniques aimed at controlling *Crassula helmsii*. The trials were monitored and the results disseminated through a report.

The report concluded that "a significant reduction in *C. helmsii* was observed following treatment with herbicide and hot foam, but to date none of the treatments have been effective in eradicating *C. helmsii* at a site. *C. helmsii* was able to re-grow to the same or greater extent following treatment which is highly undesirable in ponds which contain species with high conservation value. In permanent ponds, fragments of *C. helmsii* from deeper water re-colonised the pond margin, therefore, both hot foam and herbicide treatments could only be used to eradicate *C. helmsii* in ponds which dry out completely."

As the mite would only affect emergent and terrestrial growth forms of *Crassula helmsii*, my organisation queries whether it would be effective as a biological control agent in permanent ponds where the submerged form would presumably be able to re-grow to the same or greater extent which 'is highly undesirable in ponds which contain species with high conservation value'. However, as the mite would be likely to reduce the vigour of *Crassula helmsii* in emergent and terrestrial situations (through reduced growth and shortening of secondary and tertiary shoots), thereby allowing less competitive species to grow alongside, we consider that there is merit in introducing the mite as a biological control agent.

The need for biological control of *Crassula helmsii*

The PRA recognises that *Crassula helmsii* has invaded many sites of high nature conservation value and that the presence of this species often leads to protected sites being labelled as being in 'unfavourable condition'.

The PRA also recognises the high costs involved in attempts to control *Crassula helmsii*.

The report mentioned earlier concluded: -

"Eradication was not possible following multiple treatments even in the same year; therefore successful treatment may only be possible with repeat treatments over a number of years. The ongoing treatment which would be required could also have a negative effect on native plant species. The unpredictability of the UK climate and re-colonisation of *C. helmsii* from adjacent sites means that planning a successful eradication programme is unfeasible in the [study site] at this time"

We are mindful of the shortcomings of methods which have been trialled to control *Crassula helmsii* and consider that the cost of such techniques (even if these were effective) would be prohibitive to achieve effective control on a large scale.

We recognise the likely benefits to be achieved by the introduction of the mite as a biological control agent for *Crassula helmsii*. The laboratory tests undertaken by CABI (which show that feeding by the mite significantly reduces stem growth and delays the growth and reduces the length of secondary shoots) indicate that in the field the impact of the mite could potentially lead to shorter, less dominant/competitive *Crassula helmsii* plants which are easier to manage, with fewer vegetative propagules available to spread.

We therefore cautiously support the proposal to introduce the mite as a biological control agent for *Crassula helmsii*.

Response 9

I would like to support this introduction. I do feel that the law also needs improving to stop the import of pest plants from the EU. Currently customs have no roll and it is down to members of the public to report filthy garden centres to the police, after countless problem plants have been sold with contaminated water plants. The agencies should produce information packs and distribute them regularly. Every garden centre should pay for training of staff and inspections and penalties should include temporary or permanent closure of the business. Centres selling aquatic plants should be subject to a licensing system.

Further concerns

Response 10

We welcome the opportunity to comment on the PRA for *Aculus* sp. and the proposal to release *Aculus* sp. as a non-native biological control agent for the control of *Crassula helmsii* (Australian swap-stonecrop). We are concerned with the potential impact of *Aculus* sp. on *C. aquatica* and with respect to that, suggest the following:

- Given that *Aculus* sp. could spread through a number of routes (wind, members of the public and through accidental spread), monitoring of *Aculus* sp., particularly around *C. aquatica* would be highly recommended.
- As *Aculus* sp. reduces the fitness of *C. helmsii* rather than eliminating it, *Aculus* sp. may have long term persistence and spread in the environment. Given that, the suggestion for a medium term monitoring programme should be reviewed.
- In addition, steps to control *Aculus* sp. should be considered if non-target impacts are identified through monitoring.

Response 11

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Some priority ratings in Table 1 (the Test Plant list) are questionable. Three Red List species - *Crassula aquatica*, *Hydrocharis morsus-ranae* and *Saxifraga hypnoides* - are given a rating of 1; *Luronium natans* (Habitats Directive Annexes II and IV) and the Red List species *Damasonium alisma* are given a rating of only 2. All these plants warrant a priority rating higher than that for common plants such as *Typha latifolia* and *Potamogeton crispus*.

No view

Response 12

Thank you for these documents. We have decided that we do not have sufficient experience in this field to provide an evaluation.

Response 13

We do not have a corporate view on this matter.

Previous contribution

Response 14

Many thanks for sending the documentation relating to the release of this biological control agent for *Crassula*. However, we have already provided feedback via the peer review process prior to the public consultation.