

JOSH GREEN, M.D.
Governor

SYLVIA LUKE
Lt. Governor



SHARON HURD
Chairperson, Board of Agriculture

DEXTER KISHIDA
Deputy to the Chairperson

State of Hawai'i
DEPARTMENT OF AGRICULTURE
KA 'OIHANA MAHI'AI
1428 South King Street
Honolulu, Hawai'i 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

November 17, 2023

To: Advisory Committee on Plants and Animals

From: Darcy E. Oishi, Acting Manager
Plant Pest Control Branch
Hawai'i Department of Agriculture

Through: Christopher Kishimoto
Entomologist
Plant Quarantine Branch
Hawai'i Department of Agriculture

Subject: Request to: (1) Preliminarily Review the Currently Unlisted Wasp, *Aprostocetus nitens* (Hymenoptera: Eulophidae), for Future Placement on the List of Restricted Animals (Part A) as a Biocontrol Agent of *Quadrastichus erythrinae* (Hymenoptera: Eulophidae), by the Hawai'i Department of Agriculture, Plant Pest Control Branch (HDOA-PPC);

(2) Provided the Wasp, *Aprostocetus nitens*, is Placed on the List of Restricted Animals (Part A), Allow the Import and Field Release from the HDOA-PPC Insect Containment Facility [Laboratory Quarantine] of the Wasp, *Aprostocetus nitens*, by Permit, for Biocontrol of *Quadrastichus erythrinae* by HDOA-PPC; and

(3) Provided the Wasp, *Aprostocetus nitens*, is Placed on the List of Restricted Animals (Part A), Establish Permit Conditions for the Import and Field Release of the Wasp *Aprostocetus nitens* as a Biocontrol Agent of *Quadrastichus erythrinae* by HDOA-PPC.

I. Summary Description of the Request

PQB NOTES: The Plant Quarantine Branch (PQB) submittal for requests for import or possession permits, distinguishes information provided by the applicant, Darcy Oishi, from procedural information and advisory comment and evaluation presented by PQB.



With the exception of PQB notes, hereafter “PQB NOTES,” the text shown below in section III from page 4 through the beginning of page 9 of the submittal was taken directly from the applicant’s application. For instance, the statements on pages 7 through 8 regarding effects on the environment are the applicant’s statements in response to standard PQB questions and are not PQB’s statements. This approach for PQB submittals aims for greater applicant participation in presenting import requests in order to move these requests to the Board of Agriculture (Board) more quickly, while distinguishing applicant provided information from PQB information. The portion of the submittal prepared by PQB, including the procedural background, environmental assessment, proposed permit conditions, and advisory review, are identified as sections II, IV, V, and VI of the submittal, which start at pages 3, 9, 10, and 14 respectively.

COMMODITY: Various field releases of the wasp, *Aprostocetus nitens* (Hymenoptera: Eulophidae: Tetrastichinae), currently held in Laboratory Quarantine

PERSON RESPONSIBLE FOR THE ORGANISM:

Darcy Oishi, Acting Manager
HDOA-PPC
1428 South King Street
Honolulu, Hawaii 96814

CATEGORY: *Aprostocetus nitens* is currently an unlisted animal. Animals not found on any list are considered prohibited until placed on a list. Additionally, Chapter 4-71, Hawai’i Administrative Rules (HAR), allows importation of unlisted animals into Hawai’i under special permits for the purpose of remediating medical emergencies or ecological disasters, or conducting scientific research that is not detrimental to agriculture, the environment, or humans by special permit, on a case-by-case basis, as approved by the Board. Chapter 150A-5.5(b), Hawaii Revised Statutes (HRS), allows articles quarantined in the biocontrol containment facilities of the department or of other government agencies engaged in joint projects with the department may be released upon issuance of a permit approved by the Board.

PQB NOTES: *The applicant is requesting that the Board place *Aprostocetus nitens* on the List of Restricted Animals (Part A) for import and field release into the environment from HDOA-PPC’s Insect Containment Facility [laboratory quarantine] for the biological control of *Quadrastichus erythrinae*. *Aprostocetus nitens* was originally brought into the HDOA-PPC Insect Containment Facility from Kenya, South Africa, and Tanzania in 2005 and 2006 for biocontrol research and host range testing. The applicant is not currently requesting a special permit at this time.*

In December 2019, a Draft Environmental Assessment (DEA) was submitted to the Office of Environmental Quality Control (OEQC) [now known as the Environmental Review Program] with an Anticipated Finding of No Significant Impact (AFNSI). The draft was published in OEQC's Environmental Notice on December 23, 2019 (See Attachment 2). The final EA with a Finding of No Significant Impact (FONSI) was published in the Environmental Notice on February 8, 2023.

II. Procedural Background

HDOA-PPC has requested that one of the lists in Chapter 4-71, Hawai'i Administrative Rules (HAR), be amended to include the wasp, *Aprostocetus nitens*. The species may be placed on the List of Conditionally Approved Animals, List of Restricted Animals (Part A or B), or the Prohibited List. Species on the Restricted or Conditionally Approved Lists may enter the State of Hawai'i under permit with conditions approved by the Board. Until placement on a list, species are considered prohibited except as provided by Section 150A-6.2(c), HRS.

Species on the List of Restricted Animals (Part A) are available for research by universities and government agencies, exhibition in municipal zoos and government-affiliated aquariums, and for other institutions for medical and scientific purposes as determined by the Board. All species listed for import require a permit for entry into the State. Based on the Board's decision, species preliminarily reviewed for future list placement on a specific list will be compiled in-house for a future rule amendment. The Board's action to preliminarily place a species on a list has no legal effect until the rule has been changed. This procedure is solely for administrative ease in preparation for amendments to the various lists.

Provided the Board acts favorably on this request for future list placement, at a future date, the proposed amendments will be brought to the Board for preliminary approval to go to public hearings. A species is listed in the rules only after: (1) following Chapter 91, HRS, rulemaking procedures, which include the public hearing process, Board adoption, and Governor's approval; or (2) alternatively, the expedited amendment procedure through Board orders, which involves an abbreviated process available in certain circumstances. Generally speaking, once a species has been placed on a respective list, it is eligible for import and/or possession. PQB can then process a permit application by having the Board approve the future importation and establishment of appropriate permit conditions for the organism and proposed purpose.

III. Information Provided by the Applicant in Support of the Application

PURPOSE:

The HDOA, with support from the Hawai'i Department of Land and Natural Resources (DLNR) and the University of Hawai'i (UH), proposes the import and field release of a eulophid parasitoid wasp to complement *Eurytoma erythrinae* for biocontrol of the erythrina gall wasp (EGW), *Quadrastichus erythrinae*, an invasive pest species that has attacked and quickly killed hundreds of *Erythrina* spp. trees in Hawai'i including the endemic wiliwili, *Erythrina sandwicensis*.

Aprostocetus nitens, a tiny stingless wasp native to South Africa, Kenya, and Tanzania, has been selected and evaluated as a new biological control agent targeting the invasive pest EGW in Hawai'i. It is a host-specific parasitoid wasp intended for statewide field release as a natural enemy of EGW which has been devastating wiliwili and related *Erythrina* species. This release will complement the success of *Eurytoma erythrinae* (Hymenoptera: Eurytomidae), a parasitoid wasp approved by the Board of Agriculture and field-released statewide in 2008 for control of EGW and will improve the survival success of wiliwili, an ecologically and culturally important native Hawaiian tree species.

DISCUSSION:

1. Person Responsible:

Darcy Oishi, Acting Manager
HDOA-PPC
1428 South King Street
Honolulu, Hawai'i 96814

2. Safeguard Facility and Practices:

The *Aprostocetus nitens* colony is currently held in quarantine at the HDOA-PPC Insect Containment Facility (ICF) at 1428 South King St., Honolulu, HI 96814 in accordance with Hawai'i Revised Statutes 150A-5.5. The *Aprostocetus nitens* colony originates from insects collected in Kenya, Tanzania, and South Africa by HDOA-PPC, UH, [other] and collaborators between 2005 and 2006. The field-collected insects were shipped and safeguarded under United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection & Quarantine Permit to Move Live Plant Pests, Noxious Weeds, and Soil Permit Numbers P526P-20-03513 and 73874 (Attachment 3) and moved directly into the HDOA-PPC ICF, for rearing and screening to eliminate associated natural enemies. Juliana Yalamar, HDOA-PPC Insectary Entomologist, will positively

identify the insects and determine them to be free of natural enemies in preparation for field release into the environment.

3. **Method of Disposition:**

If this permit request is approved, the *Aprostocetus nitens* colony will be removed from the HDOA-PPC Insect Containment Facility and transferred to the HDOA-PPC Insect Rearing Facility (Insectary) for mass rearing. Approximately 100 to 200 adults will be removed from the HDOA-PPC Insectary to be released by HDOA-PPC staff at sites throughout the State, beginning with O'ahu, Hawai'i, and Maui Islands. HDOA-PPC staff will hand-carry newly emerged adult *A. nitens*, contained in secure vials, on interisland flights from O'ahu to Hawai'i, Maui, and Kaua'i release sites. Releases will occur on the same day HDOA-PPC staff arrive on the designated island. Adult *A. nitens* individuals will be continuously released on EGW-infested *Erythrina* trees and will continue statewide until such time that it is determined to be established at intended *Erythrina* field sites. HDOA-PPC expects to rear and release thousands of individuals of this wasp until the species is established. Once *A. nitens* colonies are deemed established in the State, partner agencies including Department of Land and Natural Resources, Division of Forestry and Wildlife, University of Hawai'i, and others, will assist in liberating additional individuals at locations where HDOA-PPC needs assistance.

Post-release monitoring will be conducted at all release sites statewide by HDOA-PPC and agency partners.

If this permit request is not approved by the Board of Agriculture, the Plant Pest Control Branch will temporarily maintain colonies within the Insect Containment Facility to see if any international partners may be interested in *A. nitens*. If there is an international partner interested, then a federal permit shall be obtained for transfer. All stocks will then be disposed of by autoclave and the USDA permit will be canceled.

4. **Abstract of Organism:**

Aprostocetus nitens Prinsloo & Kelly (Hymenoptera: Eulophidae) is a natural enemy of the invasive *Quadrastichus erythrinae* (erythrina gall wasp = EGW). *A. nitens* has been evaluated in the HDOA-PPC ICF between 2005 and 2019 where it has been found to be host specific to EGW in Hawai'i. *A. nitens* larvae feed exclusively on immature larval and pupal life stages of EGW. Adult *A. nitens* feed on flower nectar. *A. nitens* is host specific to *Quadrastichus erythrinae*; there are no native species in the genus *Quadrastichus* in Hawai'i. There are also no parasitoid wasps that similarly utilize *Erythrina sandwicensis* in Hawai'i. *A. nitens* do not bite or sting humans or animals. No adverse effects are anticipated on the environment, humans, or other animals.

Taxonomy:

Aprostocetus nitens Prinsloo & Kelly, 2009 is a parasitoid wasp (Hymenoptera), classified in the family Eulophidae, subfamily Tetrastichinae.

Most species of Eulophidae are primary parasitoids of hidden larvae (e.g. leaf-mining and gall-forming orders such as Lepidoptera, Hymenoptera, Diptera, Hemiptera: Coccoidea, Thysanoptera, etc.). Some species are hyperparasitoids. Tetrastichinae is one of the two largest Eulophidae subfamilies (about 1650 species in 90 genera) with species covering all geographic areas (Reina & La Salle 2003). *Aprostocetus* is the largest Tetrastichinae genus with over 700 species described worldwide (Noyes 2001, 2019). Many species of the subgenus *Aprostocetus* are primary parasitoids of hosts in plant galls (Reina & La Salle 2003).

Description of Adults:

Aprostocetus nitens was first collected in South Africa in 1980 (Prinsloo & Kelly 2009), but it remained an unnamed species to science. *A. nitens* was first described as a new species by Prinsloo and Kelly in 2009, after it was collected in Kenya, Tanzania, and South Africa during exploratory surveys for natural enemies of the erythrina gall wasp, *Q. erythrinae*. This species is quite small (1.1–1.7 mm long), and shiny black in color with a dark metallic green tinge and yellow gaster (abdomen), antennae, and legs. The wings are transparent with brown venation. See Prinsloo and Kelly (2009) for full description (Attachment 4).

Distribution:

A. nitens is native to Africa where it has been recorded from Kenya, South Africa, and Tanzania. This species was recently described in 2009 and is not known from elsewhere in the world.

Life History:

A life history study conducted in the HDOA-PPC ICF showed that *A. nitens* adult females are synovigenic which means they can produce fertile eggs upon emerging from pupation and throughout their lifespan, laying an average of 139 eggs. Females lay eggs in galled tissues caused by EGW on *Erythrina* trees. Larvae of *A. nitens* feed exclusively on immature stages of EGW infesting *Erythrina* species of trees. Each *A. nitens* larva can complete development on a single EGW larva or pupa.

The entire life cycle for *A. nitens* from egg to adult takes approximately 20 days. This species can survive 4 days without food and lives for an average of 120 days (Yalemar et al. 2016).

Habitat/Ecology:

A. nitens is tolerant of warm and moderate temperatures and is not expected to be restricted in range by temperatures in Hawai'i. In its native range in Africa, *A. nitens* was collected in the same localities as its target host, *Quadrastichus erythrinae* and *Eurytoma erythrinae*, the first biocontrol agent released in Hawai'i against *Q. erythrinae*. Thus, *A. nitens* is expected to fare well in the range of Hawai'i[s] temperatures and environments where the target host and native *Erythrina sandwicensis* exist.

Natural Enemies:

There is no information in literature regarding the natural enemies of *A. nitens* in its native range. This species was first described to science in 2009 (Prinsloo & Kelly 2009), after collections during biocontrol exploration for natural enemies of EGW in Kenya, South Africa, and Tanzania in 2005 & 2006.

Effect on Target Pest:

A. nitens was selected as a complementary biological control agent of EGW due to its host specificity to EGW and the non-competitive effects it will have with the first-released biological agent, *Eurytoma erythrinae*. Larvae of *A. nitens* are specific to gall-forming *Quadrastichus* species of African *Erythrina* trees, as exhibited during field observations during exploration, examination of unidentified museum material, and years of testing within HDOA's Insect Containment Facility.

Unlike *E. erythrinae*, which requires multiple immature EGW individuals to develop, *A. nitens* completes its development on a single immature EGW. Eggs of *A. nitens* are oviposited inside galls, and larvae will start to feed on the developing EGW as soon as it emerges. One larva will attach itself to an EGW and suck the liquid out of the pest killing it in the process.

5. Potential Effects on the Environment and Health:

Host specificity studies were performed at the HDOA Insect Containment Facility. The results of no-choice starvation tests and multi-choice testing indicated the host range of *Aprostocetus nitens* is restricted to *Quadrastichus erythrinae*, the invasive and devastating pest to endemic Hawaiian wiliwili (*Erythrina sandwicensis*) trees and other *Erythrina* spp. In Hawai'i.

The objective of the host specificity trials conducted was to determine if *A. Nitens* would attack any non-target gall-forming insects. This method followed host specificity testing methods conducted for *Eurytoma erythrinae* (Yalemar et al., 2016; Attachment 4). The seven species tested included one Hawaiian endemic psyllid (*Pariaconus* sp.) on 'ōhi'a lehua (*Metrosideros polymorpha*); four beneficial species previously liberated for weed biological control: a scale insect (*Tectococcus ovatus*) on leaves and shoots of strawberry guava (*Psidium cattleianum*), lantana gall fly (*Eutreta xanthochaeta*) on the stems of *Lantana camara*, Hamakua pamakani gall fly (*Procecidochares alani*) on the stems of

Ageratina riparia, and Maui pamakani gall fly (*Procecidochares utilis*) on the stems of *Ageratina adenophora*; and two immigrant wasps: banyan leaf-galling wasp (*Josephiella microcarpae*) and a eucalyptus gall wasp (*Ophelimus* sp.) on eucalyptus leaves.

Host specificity assays consisted of two types of tests. Choice tests, which approximate choices of host the parasitoid would be presented within the field, and no-choice tests to determine whether *A. nitens* (the agent) would feed on non-target hosts in the absence of its intended host. In a choice test, the agent is allowed to choose plants infested by either the target (EGW) or a non-target gall-forming insect for oviposition and development. In the no-choice test, the agent is given only the option of using a non-target gall-former as host. At the end of each test, the mature agents are removed, and the plant is held in a cage to await the emergence of any offspring from the agents exposed to the galls. After 1 month, galls from each test plant are dissected and examined under a microscope to determine whether parasitism has taken place (Yalemar et al. 2016). Results of the host specificity trials indicate that *A. nitens* is host specific and has no preference for any of the seven non-target gall-forming species studied. In addition, even if *A. nitens* were to parasitize these non-target species, it would be unable to produce any offspring because none of these species was shown to be suitable for supporting this species' development.

Field observations in *A. nitens*' natural habitat in Africa and quarantine studies in Hawai'i (HDOA-PPC ICF) strongly indicate that the proposed release of this *Erythrina* gall wasp biocontrol agent will not have any undesirable, negative, non-target effects on the natural environment of the Hawaiian Islands. Environmental impacts associated with the No Action Alternative of not issuing permits for release are those resulting from the continued damage to the endemic wiliwili tree and other species in the genus *Erythrina* caused by EGW and environmental damage caused by other methods (such as systemic pesticides) employed to control EGW in affected trees. The proposed release and establishment of *A. nitens* is expected to supplement the success of *E. erythrinae* in suppressing infestations of *Erythrina* gall wasp, effectively reducing these impacts further.

References:

Noyes, J.S. 2001. Taxapad 2001. Chalcidoidea. Electronic Publication (CD-ROM). Dicky S. Yu, Bentall Centre, Vancouver, Canada.

Noyes, J.S. 2013. Universal Chalcidoidea Database. World Wide Web electronic publication. <http://www.nhm.ac.uk/chalcidoids>

Prinsloo, G.H. and J.A. Kelly. 2009. The tetrastichine wasps (Hymenoptera: Chalcidoidea: Eulophidae) associated with galls on *Erythrina* species (Fabaceae) in South Africa, with the description of five new species. *Zootaxa* 2083: 27–45.

Reina P. and J. La Salle J. 2003. Key to the World Genera of Eulophidae Parasitoids (Hymenoptera) of Leafmining Agromyzidae (Diptera).
https://keys.lucidcentral.org/keys/v3/eulophidae_parasitoids/

Yalemar, J., R. Bautista, and W. Nagamine. 2016. Host Specificity and Biological Studies for *Aprostocetus nitens* (Hymenoptera: Eulophidae), Another Potential Biological Control Agent of the Erythrina Gall Wasp, *Quadrastichus erythrinae* Kim (Hymenoptera: Eulophidae). Unpublished report.

IV. **Environmental Assessment (EA):**

Pursuant to a May 2008 Hawai'i Intermediate Court of Appeals decision ([‘Ohana Pale Ke Ao v. Board of Agriculture, 118 Haw. 247 \(Haw. App. 2008\)](#)), the Department of Agriculture's (Department's) import permit process is subject to the requirements of the Hawai'i Environmental Protection Act, chapter 343, Hawai'i Revised Statutes (HRS). Under this decision, the requirement for an EA as a condition of the import permit or related authorization applies in those circumstances where the underlying permit activity for the importation initiates a "program or project" and where the use of state or county funds or state or county lands is involved. When those circumstances are present, as they appear to be when a new organism is used in a new program or project located at a facility located at the Hawaii Department of Agriculture (state lands), an EA is required to determine whether the proposed project or program is likely to have a significant impact on the environment. However, certain activities may be eligible for "exemption" under provisions established through the Environmental Advisory Council, provided that the project or program is determined to have little or no impact on the environment.

Analysis of Application re EA: Under the above-cited court decision, the EA requirement is triggered under certain circumstances, including when an applicant proposes an action on state lands that requires agency approval and is not specifically exempted under Chapter 343, HRS. That is the case here. The applicant's request in this instance involves the field-release of *Aprostocetus nitens* for research and biocontrol of *Quadrastichus erythrinae* (EGW) in the environment. So, agency approval is required for the applicant's proposed action/activity on state lands or sensitive habitats. As PQB understands the court's analysis in the [‘Ohana Pale](#) decision, the activity proposed under this permit application would initiate a project that may use state lands and/or sensitive habitats, initially triggering the EA requirement.

HDOA-PPC submitted a Draft EA prepared by HDOA and the Hawai'i Department of Land and Natural Resources (DLNR) with an Anticipated Finding of No Significant Impact. The Draft EA was published in the Office of Environmental Quality Control's Environmental Notice on December 23, 2019 (See Attachment 2). From this date, the Draft EA was open to a public comment period of 30 days. All comments received

during the open public comment period are included within the Draft Final Environmental Assessment (Attachment 5).

The final EA including the FONSI was published in the Environmental Notice, on February 8, 2023 (FONSI transmittal letter is presented as Attachment 6)

V. Proposed Permit Conditions

1. The restricted article(s), *Aprostocetus nitens*, which includes progeny, shall be used for field release and research, a purpose approved by the Board of Agriculture (Board), and shall not be sold, given away, or transferred in Hawai'i, except as approved by the Board or upon determination of establishment in the field by the Hawaii Department of Agriculture (HDOA) Plant Pest Control Branch (PPC).
2. The permittee, HDOA PPC, 1428 South King St., Honolulu, HI 96814, shall be responsible and accountable for all restricted article(s) until their final disposition.
3. The restricted article(s) shall be safeguarded and maintained at the U.S. Department of Agriculture (USDA) approved Insect Containment Facility located at the HDOA-PPC, 1428 South King Street, Honolulu, Hawaii 96814 or the Hawaii Volcanoes National Park Containment Facility, Kilauea Research Station, Building 34, Volcano, HI 96718, by trained or certified personnel designated by the permittee.
4. Upon request by the Plant Quarantine Branch (PQB), the permittee shall submit samples of the restricted article(s) prior to field release to the PQB.
5. Upon entry into a PQB approved containment facility, the restricted article(s) shall be screened for other species, predators, parasites, parasitoids or hyperparasitoids for a minimum of two generations in the USDA approved Insect Containment Facility, USDA FS, Hawaii Volcanoes National Park Containment Facility, Kilauea Research Station, Building 34, Volcano, HI 96718 or the HDOA-PPC Containment Facility, 1428 South King Street, Honolulu, Hawaii 96814. A report shall be submitted to PQB detailing the discovery of any organisms found other than the restricted article(s).
6. In the event the restricted article(s) become parasitized or infected by disease, the permittee shall:
 - a. Destroy the entire lot of the restricted article(s) by freezing;
 - b. Autoclave all insects, dietary and oviposition media; and

- c. Subject all used cages and equipment to autoclaving or treatment with a bleach solution containing at least 0.5% sodium hypochlorite concentration.
7. At least 48 hours prior to importing any parcel containing the restricted article(s), the permittee shall notify the PQB Chief in writing and provide the following information:
 - a. Expected arrival date;
 - b. Waybill, bill of lading, and/or tracking number;
 - c. Name and address of the shipper;
 - d. Name and address of the importer or importer's agent in the State of Hawaii;
 - e. Number of packages;
 - f. Description of contents of each package (including scientific name); and Port of entry into the State (Honolulu, per number 11, below).
8. At least four sides of all parcels containing the restricted article(s) imported into the State shall be clearly and legibly marked: **"This parcel may be opened and delayed for agricultural inspection in Hawaii"** in 2-inch minimum sized font.
9. The restricted article(s) shall be shipped in sturdy PQB-approved containers designed to be escape-proof and leak-proof.
10. Each shipment of the restricted article(s) shall be accompanied by a complete copy of the PQB permit for the restricted article(s) and an invoice, packing list or other similar PQB-approved document listing the scientific and common names of the restricted article(s), the quantity of the restricted article(s), the shipper, and the permittee(s) for the restricted article(s).
11. All parcels containing the restricted article(s) shall be subject to inspection by the PQB prior to entering the State and shall be imported through the port of Honolulu except as designated by the Board. Entry into Hawaii through another port is prohibited unless designated by the Board.
12. The approved site, restricted article(s), progeny, records, and any other document pertaining to the restricted article(s) and progeny under this permit, may be subject to post-entry inspections by the PQB. The permittee shall make the site, restricted article(s), progeny, and records pertaining to the restricted article(s) available for inspection upon request by a PQB inspector.

13. It is the responsibility of the permittee to comply with any applicable requirements of municipal, state, or federal law pertaining to the restricted article(s).
14. The permittee shall submit to the PQB Chief a copy of all valid licenses, permits, certificates or their equivalent required for the restricted article(s) or for their import, possession, movement, or transfer. The permit issued by the PQB Chief may be canceled upon revocation, suspension, or termination of any of the aforementioned documents.
15. The permittee shall submit an annual report to the PQB no later than January 31st of the following year, of the results of post release monitoring programs, and shall include the following:
 - a. Amount of the restricted article(s) released and number of releases for the year;
 - b. Establishment and current field populations of the restricted article(s);
 - c. Effect of the restricted article(s) on *Quadrastichus erythrinae*; and
 - d. Effect of the restricted article(s) on native plant and animal species.
16. The permittee shall adhere to the use, facility, equipment, procedures, and safeguards described in the permit application, and as approved by the Board and the PQB Chief.
17. The permittee shall have a biosecurity manual available for review and approval by the PQB, at the time of the initial site inspection and any subsequent post-entry inspection(s), which identifies the practices and procedures to be adhered to by the permittee to minimize or eliminate the risk of theft, escape, or accidental release of the restricted article(s), including the risk of introduction and spread of diseases and pests associated with the restricted article(s) to the environment. The permittee shall adhere to all practices and procedures as stated in this biosecurity manual.
18. The permittee shall immediately notify the PQB Chief verbally and in writing under the following circumstances:
 - a. If any escape, theft, accidental release, parasitoid, hyperparasitoid, or other pest or disease outbreaks involving the restricted article(s) under this permit occurs.
 - b. Prior to any changes to the approved site, facility and/or procedures regarding the restricted article(s) being made, the permittee shall also submit a written report documenting the specific changes to the PQB Chief for approval.

- c. If a shipment of the restricted article(s) is delivered to the permittee without a PQB “Passed” stamp, tag or label affixed to the article, container, or delivery order that indicates that the shipment has passed inspection and is allowed entry into the State, then the permittee shall not open or tamper with the shipment and shall secure, as evidence, all restricted article(s), shipping container(s), shipping document(s) and packing material(s) for PQB inspection.
 - d. If the permittee will no longer import or possess the restricted article(s) authorized under this permit.
19. The permittee shall be responsible for all costs, charges, or expenses incident to the inspection, treatment, or destruction of the restricted article(s) under this permit, as provided in Act 173, Session Laws of Hawaii 2010, section 13, including, if applicable, charges for overtime wages, fixed charges for personnel services, and meals.
20. Any violation of the permit conditions may result in citation, permit cancellation, and enforcement of any or all the penalties set forth in HRS §150A-14.
21. A cancelled permit is invalid and upon written notification from the PQB Chief, all restricted article(s) listed on the permit shall not be imported. In the event of permit cancellation, any restricted article(s) imported under permit may be moved, seized, treated, quarantined, destroyed, or sent out of State at the discretion of the PQB Chief. Any expense or loss in connection therewith shall be borne or paid by the permittee.
22. This permit or conditions of this permit are subject to cancellation or amendment at any time due to changes in administrative rules restricting or disallowing import of the restricted article(s) or due to Board action disallowing a previously permitted use of the restricted article(s).
23. These permit conditions are subject to amendment by the PQB Chief in the following circumstances:
 - a. To require disease screening, quarantine measures, and/or to place restrictions on the intrastate movement of the restricted article(s), as appropriate, based on scientifically validated risks associated with the restricted article(s), as determined by the PQB Chief, to prevent the introduction or spread of disease(s) and/or pests associated with the restricted article(s); or

- b. To conform to more recent Board approved permit conditions for the restricted article(s), as necessary to address scientifically validated risks associated with the restricted article(s).
24. The permittee(s) shall agree in advance to defend and indemnify the State of Hawai'i, its officers, agents, and employees for any and all claims against the State of Hawai'i, its officers, agents, employees, or Board of Agriculture members that may arise from or be attributable to any of the restricted article(s) that are introduced under this permit. This permit condition shall not apply to a permittee that is a federal or State of Hawai'i entity or employee, provided that the State or federal employee is a permittee in the employee's official capacity.

VI. Advisory Subcommittee Review: This request was submitted to the Advisory Subcommittee on Entomology for its review and recommendation. Advisory Subcommittee recommendations and comments are as follows:

1. **I recommend Approval ___ / ___ Disapproval of future placement of the unlisted wasp, *Aprostocetus nitens* Prinsloo & Kelly, 2009 (Hymenoptera: Eulophidae) on the List of Restricted Animals (Part A) as a biocontrol agent for the invasive *Quadrastichus erythrinae* (Hymenoptera: Eulophidae).**

Dr. Daniel Rubinoff: Recommends Approval.

Dr. Mark Wright: Recommends Approval.

Comments: The quarantine screening shows that this species will not pose any risks to native species in Hawaii.

Dr. Francis Howarth: Recommends Approval.

Comments: I approve with reservations. The host specificity testing seems limited; only a few non-target species tested and most (e.g. Diptera) were inappropriate. Also, as I have commented many times, there needs to be a more specific description on post-release monitoring. What methods will be used? How much money, personnel, and effort are expressly committed to monitoring? Good grief, without appropriate monitoring, we will never know what we are doing right or wrong – and thus cannot improve methods used in biocontrol. The vague statement that monitoring will be done is highly suspect. There also needs to be an appropriate review of the results of monitoring. I recommend review by the advisory committee, and I would very much like to see the annual reports.

PQB NOTES: *HDOA's Plant Pest Control Branch has made their work plan for monitoring of A. nitens releases available. The work plan is designated as Attachment 8.*

Permit condition no. 15. The permittee shall submit an annual report to the PQB no later than January 31st of the following year, of the results of post release monitoring programs, and shall include the following:

- a. Amount of the restricted article(s) released and number of releases for the year;
- b. Establishment and current field populations of the restricted article(s);
- c. Effect of the restricted article(s) on *Quadrastichus erythrinae*; and
- d. Effect of the restricted article(s) on native plant and animal species

Dr. Peter Follett: Recommends Approval.

Comments: This biocontrol agent of erythrina gall wasp appears to be host specific and therefore will have no adverse effects on the Hawaii environment and may provide indispensable mortality against the pest. The absence of a publication on the host specificity testing is concerning as this means the research has not undergone peer-review by experts in the field. Seven gall-forming nontargets were tested with apparently no successful attack or development. Hopefully, the target host was included in all replicates of nontarget testing to demonstrate *A. nitens* competence, i.e., to show that wasps used in each test were healthy and the environmental conditions suitable for successful parasitism. Nevertheless, erythrina gall wasp is an important pest of a native tree and biocontrol is the best option for pest management.

PQB NOTES: Subsequently, Dr. Follett read the environmental assessment including Figure 11, which shows erythrina gall wasp parasitism along with each non-target species. Dr. Follett further commented that the environmental assessment looked very good and that he fully supports this project.

2. **Provided *Aprostocetus nitens* is placed on the List of Restricted Animals (Part A), I recommend Approval ___/___ Disapproval to allow the importation and field release of *Aprostocetus nitens*, by permit, for biological control of *Quadrastichus erythrinae* by the HDOA-PPC.**

Dr. Daniel Rubinoff: Recommends Approval.

Comments: Can / Should Molokai be added as a release site?

Dr. Mark Wright: Recommends Approval.

Comments: The quarantine screening shows host specificity on erythrina gall wasp, and also strongly suggests that *A. nitens* will provide improved suppression of galls on inflorescences and infructescences of *Erythrina*. This

should result in increased seed set and hopefully improved opportunity for recruitment of endemic *Erythrina*.

Dr. Francis Howarth: Recommends Approval.

Comments: See above.

Dr. Peter Follett: Recommends Approval.

3. **Provided *Aprostocetus nitens* is placed on the List of Restricted Animals (Part A), I recommend Approval___/___Disapproval to establish permit conditions for the importation and field release from containment of *Aprostocetus nitens* as a biocontrol agent of *Quadrastichus erythrinae* by the HDOA-PPC.**

Dr. Daniel Rubinoff: Recommends Approval.

Comments: Applicants appear to have done their homework. Non-target impacts have been evaluated and this would be a valuable addition to erythrina gall wasp control programs.

Dr. Mark Wright: Recommends Approval.

Dr. Francis Howarth: Recommends Approval.

Comments: See above.

Dr. Peter Follett: Recommends Approval.