

CHAPTER 10.2.

INFECTION WITH *APHANOMYCES INVADANS* (EPIZOOTIC ULCERATIVE SYNDROME)

Article 10.2.1.

For the purposes of the *Aquatic Code*, infection with *Aphanomyces invadans* means all infections caused by the Oomycete fungus *A. invadans* (syn. *A. piscicida*). The disease was previously referred to as epizootic ulcerative syndrome.

Standards for diagnostic tests are described in the *Aquatic Manual*.

Article 10.2.2.

Scope

The recommendations in this chapter apply to: yellowfin seabream (*Acanthopagrus australis*), climbing perch (*Anabas testudineus*), eels (*Anguillidae*), bagrid catfishes (*Bagridae*), silver perch (*Bidyanus bidyanus*), Atlantic menhaden (*Brevoortia tyrannus*), jacks (*Caranx* spp.), catla (*Catla catla*), striped snakehead (*Channa striatus*), mrigal (*Cirrhinus mrigala*), torpedo-shaped catfishes (*Clarius* spp.), halfbeaks flying fishes (*Exocoetidae*), tank goby (*Glossogobius giuris*), marble goby (*Oxyeleotris marmoratus*), gobies (*Gobiidae*), rohu (*Labeo rohita*), rhinofishes (*Labeo* spp.), barramundi and giant sea perch (*Lates calcarifer*), striped mullet (*Mugil cephalus*), mullets (*Mugilidae*) (*Mugil* spp. and *Liza* spp.), ayu (*Plecoglossus altivelis*), pool barb (*Puntius sophore*), barcoo grunter (*Scortum barcoo*), sand whiting (*Sillago ciliata*), wells catfishes (*Siluridae*), snakeskin gourami (*Trichogaster pectoralis*), common archer fish (*Toxotes chatareus*), silver barb (*Puntius gonionotus*), spotted scat (*Scatophagus argus*), giant gourami (*Osphronemus goramy*), dusky flathead (*Platycephalus fuscus*), spiny turbot (*Psettodes* sp.), Tairiku-baratanago (*Rhodeus ocellatus*), Keti-Bangladeshi (*Rohtee* sp.), rudd (*Scaridinius erythrophthalmus*), theraon (*Terapon* sp.) and three-spot gouramy (*Trichogaster trichopterus*). These recommendations also apply to any other susceptible species referred to in the *Aquatic Manual* when traded internationally.

Article 10.2.3.

Importation or transit of aquatic animals and aquatic animal products for any purpose from a country, zone or compartment not declared free from infection with *A. invadans*

- 1) *Competent Authorities* should not require any conditions related to infection with *A. invadans*, regardless of the infection with *A. invadans* status of the exporting country, zone or compartment, when authorising the importation or transit of the following aquatic animals and aquatic animal products from the species referred to in Article 10.2.2. which are intended for any purpose and which comply with Article 5.4.1.:
 - a) heat sterilised hermetically sealed fish products (i.e. a heat treatment at 121°C for at least 3.6 minutes or any time/temperature equivalent);
 - b) pasteurised fish products that have been subjected to heat treatment at 90°C for at least ten minutes (or any time/temperature equivalent which has been demonstrated to inactivate *A. invadans*);
 - c) mechanically dried eviscerated fish (i.e. a heat treatment at 100°C for at least 30 minutes or any time/temperature equivalent which has been demonstrated to inactivate *A. invadans*);
 - d) fish oil;
 - e) fish meal;
 - f) frozen eviscerated fish;
 - g) frozen fish fillets or steaks.

- 2) When authorising the importation or transit of *aquatic animals* and *aquatic animal products* of a species referred to in Article 10.2.2., other than those referred to in point 1 of Article 10.2.3., *Competent Authorities* should require the conditions prescribed in Articles 10.2.7. to 10.2.11. relevant to *infection* with *A. invadans* status of the *exporting country, zone or compartment*.
- 3) When considering the importation or transit of *aquatic animals* and *aquatic animal products* from an *exporting country, zone or compartment* not declared free from *infection* with *A. invadans* of a species not covered in Article 10.2.2. but which could reasonably be expected to pose a *risk* of spread of *infection* with *A. invadans*, the *Competent Authority* should conduct a *risk analysis* in accordance with the recommendations in Chapter 2.1. The *exporting country* should be informed of the outcome of this assessment.

Article 10.2.4.

Country free from infection with *A. invadans*

If a country shares a *zone* with one or more other countries, it can only make a *self-declaration of freedom* from *infection* with *A. invadans* if all the areas covered by the shared water bodies are declared countries or *zones* free from *infection* with *A. invadans* (see Article 10.2.5.).

As described in Article 1.4.6., a country may make a *self-declaration of freedom* from *infection* with *A. invadans* if:

- 1) a country where there has been no observed occurrence of *infection* with *A. invadans* for at least the last ten years despite conditions that are conducive to its clinical expression, as described in the corresponding chapter of the *Aquatic Manual*, may make a *self-declaration of freedom* from *infection* with *A. invadans* when *basic biosecurity conditions* have been continuously met in the country for at least the last ten years;

OR

- 2) the disease status prior to *targeted surveillance* is unknown but the following conditions have been met:
 - a) *basic biosecurity conditions* have been continuously met for at least the last two years; and
 - b) *targeted surveillance*, as described in Chapter 1.4., has been in place for at least the last two years without detection of *infection* with *A. invadans*;

OR

- 3) it previously made a *self-declaration of freedom* from *infection* with *A. invadans* and subsequently lost its *disease free status* due to the detection of *infection* with *A. invadans* but the following conditions have been met:
 - a) on detection of the *disease*, the affected area was declared an *infected zone* and a *protection zone* was established; and
 - b) infected populations have been destroyed or removed from the *infected zone* by means that minimise the *risk* of further spread of the *disease*, and the appropriate *disinfection* procedures (as described in the *Aquatic Manual*) have been completed; and
 - c) previously existing *basic biosecurity conditions* have been reviewed and modified as necessary and have continuously been in place since eradication of the *disease*; and
 - d) *targeted surveillance*, as described in Chapter 1.4., has been in place for at least the last two years without detection of *infection* with *A. invadans*.

In the meantime, part or all of the non-affected area may be declared a *free zone* provided that such a part meets the conditions in point 2 of Article 10.2.5.

Article 10.2.5.

Zone or compartment free from infection with *A. invadans*

If a *zone* or *compartment* extends over more than one country, it can only be declared a *zone* or *compartment* free from *infection* with *A. invadans* if all the relevant *Competent Authorities* confirm that all relevant conditions have been met.

As described in Article 1.4.6., a *zone* or *compartment* within the *territory* of one or more countries not declared free from *infection* with *A. invadans* may be declared free by the *Competent Authority(ies)* of the country(ies) concerned if:

- 1) a *zone* or *compartment* where the species referred to in Article 10.2.2. are present but there has been no observed occurrence of the *disease* for at least the last ten years despite conditions that are conducive to its clinical expression, as described in the corresponding chapter of the *Aquatic Manual*, may be declared free from *infection* with *A. invadans* when *basic biosecurity conditions* have been continuously met in the *zone* or *compartment* for at least the last ten years;

OR

- 2) the *disease* status prior to *targeted surveillance* is unknown but the following conditions have been met:
 - a) *basic biosecurity conditions* have been continuously met for at least the last two years; and
 - b) *targeted surveillance*, as described in Chapter 1.4., has been in place, in the *zone* or *compartment*, for at least the last two years without detection of *infection* with *A. invadans*;

OR

- 3) it previously made a *self-declaration of freedom* for a *zone* from *infection* with *A. invadans* and subsequently lost its *disease* free status due to the detection of *infection* with *A. invadans* in the *zone* but the following conditions have been met:
 - a) on detection of the *disease*, the affected area was declared an *infected zone* and a *protection zone* was established; and
 - b) infected populations have been destroyed or removed from the *infected zone* by means that minimise the *risk* of further spread of the *disease*, and the appropriate *disinfection* procedures (as described in the *Aquatic Manual*) have been completed; and
 - c) previously existing *basic biosecurity conditions* have been reviewed and modified as necessary and have continuously been in place since eradication of the *disease*; and
 - d) *targeted surveillance*, as described in Chapter 1.4., has been in place for at least the last two years without detection of *infection* with *A. invadans*.

Article 10.2.6.

Maintenance of free status

A country, *zone* or *compartment* that is declared free from *infection* with *A. invadans* following the provisions of point 1 of Articles 10.2.4. or 10.2.5. (as relevant) may maintain its status as free from *infection* with *A. invadans* provided that *basic biosecurity conditions* are continuously maintained.

A country, *zone* or *compartment* that is declared free from *infection* with *A. invadans* following the provisions of point 2 of Articles 10.2.4. or 10.2.5. (as relevant) may discontinue *targeted surveillance* and maintain its status as free from *infection* with *A. invadans* provided that conditions that are conducive to clinical expression, as described in the corresponding chapter of the *Aquatic Manual*, exist and *basic biosecurity conditions* are continuously maintained.

However, for declared free *zones* or *compartments* in infected countries and in all cases where conditions are not conducive to clinical expression of *infection* with *A. invadans*, *targeted surveillance* needs to be continued at a level determined by the *Aquatic Animal Health Service* on the basis of the likelihood of *infection*.

Article 10.2.7.

Importation of aquatic animals and aquatic animal products from a country, zone or compartment declared free from infection with *A. invadans*

When importing *aquatic animals* and *aquatic animal products* of species referred to in Article 10.2.2. from a country, *zone* or *compartment* declared free from *infection* with *A. invadans*, the *Competent Authority* of the *importing country* should require that the consignment be accompanied by an *international aquatic animal health certificate* issued by the *Competent Authority* of the *exporting country* or a *certifying official* approved by the *importing country* certifying that, on the basis of the procedures described in Articles 10.2.4. or 10.2.5. (as applicable) and 10.2.6., the place of production of the *aquatic animals* and *aquatic animal products* is a country, *zone* or *compartment* declared free from *infection* with *A. invadans*.

The *certificate* should be in accordance with the Model Certificate in Chapter 5.11.

This Article does not apply to *commodities* referred to in point 1 of Article 10.2.3.

Article 10.2.8.

Importation of live aquatic animals for aquaculture from a country, zone or compartment not declared free from infection with *A. invadans*

- 1) When importing, for *aquaculture*, live *aquatic animals* of species referred to in Article 10.2.2. from a country, *zone* or *compartment* not declared free from *infection* with *A. invadans*, the *Competent Authority* of the *importing country* should assess the *risk* and, if justified, apply the following *risk* mitigation measures:
 - a) the direct delivery to and lifelong holding of the consignment in biosecure facilities for continuous isolation from the local environment; and
 - b) the treatment of water used in transport and of all effluent and waste materials in a manner that ensures inactivation of *A. invadans*.
- 2) If the intention of the introduction is the establishment of a new stock, relevant aspects of the Code of Practice on the Introductions and Transfers of Marine Organisms of the International Council for the Exploration of the Seas (ICES) should be considered.
- 3) For the purposes of the *Aquatic Code*, relevant aspects of the ICES Code (full version see: <http://www.ices.dk/publications/our-publications/Pages/Miscellaneous.aspx>) may be summarised to the following points:
 - a) identify stock of interest (cultured or wild) in its current location;
 - b) evaluate stock health and disease history;
 - c) take and test samples for *A. invadans*, pests and general health/disease status;
 - d) import of a founder (F-0) population and quarantine in a secure facility;
 - e) produce F-1 generation from the F-0 stock in *quarantine*;
 - f) culture F-1 stock and at critical times in its development (life cycle) sample and test for *infection* with *A. invadans* and perform general examinations for pests and general health/disease status;
 - g) if *infection* with *A. invadans* is not detected, pests are not present, and the general health/disease status of the stock is considered to meet the *basic biosecurity conditions* of the *importing country, zone* or *compartment*, the F-1 stock may be defined as *infection* with *A. invadans* free or specific pathogen free (SPF) for *infection* with *infection* with *A. invadans*;
 - h) release SPF F-1 stock from *quarantine* for *aquaculture* or stocking purposes in the country, *zone* or *compartment*.
- 4) With respect to point 3 e), *quarantine* conditions should be conducive to multiplication of the pathogen and eventually to clinical expression. If *quarantine* conditions are not suitable for pathogen multiplication and development, the recommended diagnostic approach might not be sensitive enough to detect low *infection* level.

This Article does not apply to *aquatic animals* referred to in point 1 of Article 10.2.3.

Article 10.2.9.

Importation of aquatic animals and aquatic animal products for processing for human consumption from a country, zone or compartment not declared free from infection with *A. invadans*

When importing, for processing for human consumption, *aquatic animals* or *aquatic animal products* of species referred to in Article 10.2.2. from a country, *zone* or *compartment* not declared free from *infection* with *A. invadans*, the *Competent Authority* of the *importing country* should assess the *risk* and, if justified, require that:

- 1) the consignment is delivered directly to and held in *quarantine* or containment facilities until processing into one of the products referred to in point 1 of Article 10.2.3., or products described in point 1 of Article 10.2.11., or other products authorised by the *Competent Authority*; and
- 2) water used in transport and all effluent and waste materials from the processing are treated in a manner that ensures inactivation of *A. invadans* or is disposed in a manner that prevents contact of waste with *susceptible species*.

For these *commodities* Member Countries may wish to consider introducing internal measures to address the *risks* associated with the *commodity* being used for any purpose other than for human consumption.

Article 10.2.10.

Importation of live aquatic animals intended for use in animal feed, or for agricultural, industrial or pharmaceutical use, from a country, zone or compartment not declared free from infection with *A. invadans*

When importing, for use in animal *feed* or for agricultural, industrial or pharmaceutical use, live *aquatic animals* of species referred to in Article 10.2.2. from a country, *zone* or *compartment* not declared free from *infection* with *A. invadans*, the *Competent Authority* of the *importing country* should require that:

- 1) the consignment is delivered directly to, and held in, *quarantine* facilities for slaughter and processing into products authorised by the *Competent Authority*; and
- 2) water used in transport and all effluent and waste materials from the processing are treated in a manner that ensures inactivation of *A. invadans*.

This Article does not apply to *commodities* referred to in point 1 of Article 10.2.3.

Article 10.2.11.

Importation of aquatic animals and aquatic animal products for retail trade for human consumption from a country, zone or compartment not declared free from infection with *A. invadans*

- 1) *Competent Authorities* should not require any conditions related to *infection* with *A. invadans*, regardless of the *infection* with *A. invadans* status of the *exporting country*, *zone* or *compartment*, when authorising the importation or transit of fish fillets or steaks (chilled) which have been prepared and packaged for retail trade and which comply with Article 5.4.2.

Certain assumptions have been made in assessing the safety of the *aquatic animal products* mentioned above. Member Countries should refer to these assumptions at Article 5.4.2. and consider whether the assumptions apply to their conditions.

For these *commodities* Member Countries may wish to consider introducing internal measures to address the *risks* associated with the *commodity* being used for any purpose other than for human consumption.

- 2) When importing *aquatic animals* or *aquatic animal products*, other than those referred to in point 1 above, of species referred to in Article 10.2.2. from a country, *zone* or *compartment* not declared free from *infection* with *A. invadans*, the *Competent Authority* of the *importing country* should assess the *risk* and apply appropriate *risk* mitigation measures.

