

CHAPTER 9.1.

INFECTION WITH APHANOMYCES ASTACI
(CRAYFISH PLAGUE)

Article 9.1.1.

For the purposes of the *Aquatic Code*, infection with *Aphanomyces astaci* crayfish plague means *infection with *Aphanomyces A. astaci* Schikora*. This organism is a member of a group commonly known as the Class Oomycota (water moulds) (the Oomycetida). The disease is commonly known as crayfish plague. Common synonyms are listed in the corresponding chapter of the *Aquatic Manual*.

Information on methods for *diagnosis* are provided in the *Aquatic Manual*.

Article 9.1.2.

Scope

The recommendations in this chapter apply to the following susceptible species which meet the criteria for listing species as susceptible in Chapter 1.5: noble crayfish (*Astacus astacus*), Danube crayfish (*A. leptodactylus*), signal crayfish (*Pacifastacus leniusculus*), Red swamp crawfish (*Procambarus clarkii*), *Austropotamobius torrentium*, *A. pallipes*, *Orconectes limosus*, *O. immunis*, *Procambarus alleni* and *Potamon potamios*, all species of crayfish in all three crayfish families (*Cambaridae*, *Astacidae* and *Parastacidae*). These recommendations also apply to any other susceptible species referred to in the *Aquatic Manual* when traded internationally.

Article 9.1.3.

Importation or transit of aquatic animals and aquatic animal products for any purpose regardless of the infection with *A. astaci* status of the exporting country, zone or compartment from a country, zone or compartment not declared free from crayfish plague

- 1) *Competent Authorities* should not require any conditions related to infection with *A. astaci* crayfish plague, regardless of the infection with *A. astaci* crayfish plague status of the *exporting country, zone or compartment*, when authorising the importation or transit of the following *aquatic animal products* from the species referred to in Article 9.1.2. which are intended for any purpose and which comply with Article 5.4.1.:
 - a) heat sterilised hermetically sealed crayfish products (i.e. a heat treatment at 121°C for at least 3.6 minutes or any time/temperature equivalent);
 - b) cooked crayfish products that have been subjected to heat treatment at 100°C for at least one minute (or any time/temperature equivalent which has been demonstrated to inactivate *A. astaci*);
 - c) pasteurised crayfish 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. astaci*);
 - d) frozen crayfish products that have been subjected to minus 20°C or lower temperatures for at least 72 hours;
 - e) crayfish oil;
 - f) crayfish *meal*;
 - g) chemically extracted chitin.

- 2) When authorising the importation or transit of *aquatic animals* and *aquatic animal products* of a species referred to in Article 9.1.2., other than those referred to in point 1 of Article 9.1.3., *Competent Authorities* should require the conditions prescribed in Articles 9.1.7. to 9.1.11. relevant to the infection with *A. astaci* crayfish plague status of the *exporting country, zone or compartment*.
- 3) When considering the importation or transit of *aquatic animals* and *aquatic animal products* of a species not covered in Article 9.1.2. but which could reasonably be expected to pose a ~~risk of spread~~ of infection with *A. astaci* crayfish plague, the *Competent Authority* should conduct a *risk analysis* in accordance with the recommendations in Chapter 2.1. The *Competent Authority* of the *exporting country* should be informed of the outcome of this assessment.

Article 9.1.4.

Country free from infection with *A. astaci* crayfish plague

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. astaci* crayfish plague if all the areas covered by the shared water bodies are declared countries or *zones* free from infection with *A. astaci* crayfish plague (see Article 9.1.5.).

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

- 1) none of the *susceptible species* referred to in Article 9.1.2. are present and *basic biosecurity conditions* have been continuously met for at least the last two years;

OR

- 2) any of the *susceptible species* referred to in Article 9.1.2. are present and the following conditions have been met:
 - a) there has been no observed occurrence of the *disease* for at least the last 25 years despite conditions that are conducive to its clinical expression (as described in the corresponding chapter of the *Aquatic Manual*); and
 - b) *basic biosecurity conditions* have been continuously met for at least the last 10 years;

OR

- 3) 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 five years; and
 - b) *targeted surveillance*, as described in Chapter 1.4., has been in place for at least the last five years without detection of infection with *A. astaci* crayfish plague;

OR

- 4) it previously made a *self-declaration of freedom* from infection with *A. astaci* crayfish plague and subsequently lost its *disease free status* due to the detection of infection with *A. astaci* crayfish plague 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~~ likelihood of further spread of the *disease*, and the appropriate *disinfection* procedures (as described in Chapter 4.3.) 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 five years without detection of infection with *A. astaci* crayfish plague.

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 3 of Article 9.1.5.

Article 9.1.5.

Zone or compartment free from infection with *A. astaci* crayfish plague

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. astaci* crayfish plague 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. astaci* crayfish plague may be declared free by the *Competent Authority(ies)* of the country(ies) concerned if:

- 1) none of the *susceptible species* referred to in Article 9.1.2. are present in the *zone* or *compartment* and *basic biosecurity conditions* have been continuously met for at least the last two years;

OR

- 2) any of the *susceptible species* referred to in Article 9.1.2. are present in the *zone* or *compartment* and the following conditions have been met:
 - a) there has not been any observed occurrence of the *disease* for at least the last 25 years despite conditions that are conducive to its clinical expression (as described in the corresponding chapter of the *Aquatic Manual*); and
 - b) *basic biosecurity conditions* have been continuously met for at least the last 10 years;

OR

- 3) 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 five 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 five years without detection of infection with *A. astaci* crayfish plague;

OR

- 4) it previously made a *self-declaration of freedom* for a *zone* from infection with *A. astaci* crayfish plague and subsequently lost its *disease free status* due to the detection of infection with *A. astaci* crayfish plague 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 likelihood~~ of further spread of the *disease*, and the appropriate *disinfection* procedures (as described in Chapter 4.3.) 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 five years without detection of infection with *A. astaci* crayfish plague.

Article 9.1.6.

Maintenance of free status

A country, *zone* or *compartment* that is declared free from infection with *A. astaci* crayfish plague following the provisions of points 1 or 2 of Articles 9.1.4. or 9.1.5. (as relevant) may maintain its status as free from infection with *A. astaci* crayfish plague provided that *basic biosecurity conditions* are continuously maintained.

A country, *zone* or *compartment* that is declared free from infection with *A. astaci* crayfish plague following the provisions of point 3 of Articles 9.1.4. or 9.1.5. (as relevant) may discontinue *targeted surveillance* and maintain its status as free from crayfish plague provided that conditions that are conducive to clinical expression of infection with *A. astaci* crayfish plague, 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. astaci* crayfish plague, *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 9.1.7.

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

When importing *aquatic animals* and *aquatic animal products* of species referred to in Article 9.1.2. from a country, *zone* or *compartment* declared free from infection with *A. astaci* crayfish plague, 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 9.1.4. or 9.1.5. (as applicable) and 9.1.6., the place of production of the *aquatic animals* and *aquatic animal products* is a country, *zone* or *compartment* declared free from infection with *A. astaci* crayfish plague.

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

This Article does not apply to *commodities* listed in point 1 of Article 9.1.3.

Article 9.1.8.

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

- 1) When importing, for *aquaculture*, live *aquatic animals* of species referred to in Article 9.1.2. from a country, *zone* or *compartment* not declared free from infection with *A. astaci* crayfish plague, 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. astaci*.
- 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. astaci*, 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 *A. astaci* and perform general examinations for pests and general health/disease status;
 - g) if *A. astaci* 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 free from infection with *A. astaci* ~~crayfish plague~~ free or specific pathogen free (SPF) for *A. astaci*;
 - 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* listed in point 1 of Article 9.1.3.

Article 9.1.9.

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. astaci* ~~crayfish plague~~

When importing, for processing for human consumption, *aquatic animals* or *aquatic animal products* of species referred to in Article 9.1.2. from a country, *zone or compartment* not declared free from infection with *A. astaci* ~~crayfish plague~~, 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 9.1.3., or products described in point 1 of Article 9.1.11., 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. astaci* 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 9.1.10.

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. astaci* ~~crayfish plague~~

When importing, for use in animal *feed* or for agricultural, industrial or pharmaceutical use, live *aquatic animals* of species referred to in Article 9.1.2. from a country, *zone or compartment* not declared free from infection with *A. astaci* ~~crayfish plague~~, 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. astaci*.

This Article does not apply to *commodities* referred to in point 1 of Article 9.1.3.

Article 9.1.11.

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. astaci* crayfish plague

- 1) *Competent Authorities* should not require any conditions related to crayfish plague, regardless of the infection with *A. astaci* crayfish plague status of the *exporting country, zone or compartment*, when authorising the importation or transit of the following *commodities* which have been prepared and packaged for retail trade and which comply with Article 5.4.2.:
 - no *commodities* listed.
 - 2) When importing *aquatic animals* or *aquatic animal products*, other than those referred to in point 1 above, of species referred to in Article 9.1.2. from a country, *zone or compartment* not declared free from infection with *A. astaci* crayfish plague, the *Competent Authority* of the *importing country* should assess the *risk* and apply appropriate *risk* mitigation measures.
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