

Terrestrial Animal Health Standards Commission Report

October 2008

CHAPTER 9.4.

SMALL HIVE BEETLE INFESTATION (*Aethina tumida*)

Article 9.4.1.

General provisions

For the purposes of this Chapter, small hive beetle (SHB) is an infestation of bee colonies by the beetle *Aethina tumida*, which is a free-living predator and scavenger affecting populations of the honey bee *Apis mellifera* L. It can also parasitise bumble bee *Bombus terrestris* colonies under experimental conditions, and although infestation has not been demonstrated in wild populations, *Bombus* spp. must also be considered to be susceptible to infestation.

The adult beetle is attracted to bee colonies to reproduce, although it can survive and reproduce independently in other natural environments, using other food sources, including certain types of fruit. Hence once it is established within a localised environment, it is extremely difficult to eradicate.

The life cycle of *A. tumida* begins with the adult beetle laying eggs within infested hives. These are usually laid in irregular masses in crevices or brood combs. After 2-6 days, the eggs hatch and the emerging larvae begin to feed voraciously on brood comb, bee eggs, pollen and honey within the hive. The SHB has a high reproductive potential. Each female can produce about 1,000 eggs in its 4 to 6 months of life. At maturation (approximately 10-29 days after hatching), the larvae exit the hive and burrow into soil around the hive entrance. Adult beetles emerge after an average of 3-4 weeks, although pupation can take between 8 and 60 days depending on temperature and moisture levels.

The life span of an adult beetle depends on environmental conditions such as temperature and humidity but, in practice, adult beetles can live for at least 6 months and, in favourable reproductive conditions, the female is capable of laying new egg batches every 5-12 weeks. The beetle is able to survive at least 2 weeks without food and 50 days on brood combs.

Early signs of infestation may go unnoticed, but the growth in the beetle population is rapid, leading to high mortality in the hive. Because *A. tumida* can be found and can thrive within the natural environment, and can fly up to 6-13 km from its nest site, it is capable of dispersing rapidly and directly colonising hives. Dispersal includes following or accompanying swarms. Spread of infestation does not require contact between adult bees. However, the movement of adult bees, honeycomb and other apiculture products and used equipment associated with bee-keeping may all cause infestations to spread to previously unaffected colonies.

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

Article 9.4.2.

Determination of the *A. tumida* status of a country or zone

The *A. tumida* status of a country or *zone* can only be determined after considering the following criteria:

1. *A. tumida* infestation should be notifiable in the whole country, and all signs suggestive of *A. tumida* infestation should be subjected to field and *laboratory* investigations;
2. on-going awareness and training programmes should be in place to encourage reporting of all cases suggestive of *A. tumida* infestation;
3. the *Veterinary Authority* or other *Competent Authority* with responsibility for ~~the health reporting and control of diseases~~ of honey bees should have current knowledge of, and authority over, all domesticated *apiaries* in the country.

Article 9.4.3.

Country or zone free from *A. tumida*

1. Historically free status

A country or *zone* may be considered free from the pest after conducting a *risk assessment* as referred to in Article 9.4.2. but without formally applying a specific *surveillance* programme if the country or *zone* complies with the provisions of Chapter 1.4.

2. Free status as a result of an eradication programme

A country or *zone* which does not meet the conditions of point 1 above may be considered free from *A. tumida* infestation after conducting a *risk assessment* as referred to in Article 9.4.2. and when:

- a) the *Veterinary Authority* or other *Competent Authority* with responsibility for ~~the health reporting and control of diseases~~ of honey bees has current knowledge of, and authority over, all domesticated *apiaries* existing in the country or *zone*;
- b) *A. tumida* infestation is notifiable in the whole country or *zone*, and any clinical cases suggestive of *A. tumida* infestation are subjected to field and *laboratory* investigations; a contingency plan is in place describing controls and inspection activities;
- c) for the 5 years following the last reported *case* of *A. tumida* infestation, an annual survey supervised by the ~~Competent~~ *Veterinary Authority*, with negative results, has been carried out on a representative sample of *apiaries* in the country or *zone* to provide a confidence level of at least 95% of detecting *A. tumida* infestation if at least 1% of the *apiaries* were infested at a within-*apiary* prevalence rate of at least 5% of the hives; such surveys may be targeted towards areas with a higher likelihood of infestation;
- d) to maintain free status, an annual survey supervised by the ~~Competent~~ *Veterinary Authority*, with negative results, is carried out on a representative sample of *apiaries* to indicate that there have been no new *cases*; such surveys may be targeted towards areas with a higher

likelihood of infestation;

- e) all equipment associated with previously infested *apiaries* has been destroyed, or cleaned and sterilised to ensure the destruction of *A. tumida* spp., in conformity with one of the procedures referred to in Chapter X.X. (under study);
- f) the soil and undergrowth in the immediate vicinity of all infested *apiaries* has been treated with a soil drench or similar suitable treatment that is efficacious in destroying incubating *A. tumida* larvae and pupae;
- g) the importation of the *commodities* listed in this Chapter into the country or *zone* is carried out, in conformity with the recommendations of this Chapter.

Article 9.4.4.

Recommendations on safe commodities

Regardless of the status of the *exporting country* with regard to *A. tumida* infestation, *Competent Veterinary Authorities* should authorise without restriction the import or transit through their territory of the following *commodities*:

1. honey bee semen and honey bee venom;
2. packaged extracted honey, refined or rendered beeswax, propolis and frozen or dried royal jelly.

Article 9.4.5.

Recommendations for the importation of individual consignments containing a single live queen honey bee or queen bumble bee, accompanied by a small number of associated attendants (a maximum of 20 attendants per queen)

Competent Veterinary Authorities of *importing countries* should require the presentation of an *international veterinary certificate* attesting that the bees come from a country or *zone* officially free from *A. tumida* infestation.

OR

Competent Veterinary Authorities of *importing countries* should require the presentation of an *international veterinary certificate* including an attestation from the *Competent Veterinary Authority* of the exporting third country stating that:

1. the bees come from hives or colonies which were inspected immediately prior to dispatch and show no signs or suspicion of the presence of *A. tumida* or its eggs, larvae or pupae; and
2. the bees come from an area of at least 100 km radius where no *apiary* has been subject to any restrictions associated with the occurrence of *A. tumida* for the previous 6 months; and
3. the bees and accompanying packaging presented for export have been thoroughly and individually inspected and do not contain *A. tumida* or its eggs, larvae or pupae; and
4. the consignment of bees is covered with fine mesh through which a live beetle cannot enter.

Article 9.4.6.

Recommendations for the importation of live worker bees, drone bees or bee colonies with or without associated brood combs or for live bumble bees

~~Competent~~ Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that:

1. the bees come from a country or *zone* officially free from *A. tumida* infestation; and
2. the bees and accompanying packaging presented for export have been inspected and do not contain *A. tumida* or its eggs, larvae or pupae; and
3. the consignment of bees is covered with fine mesh through which a live beetle cannot enter.

Article 9.4.7.

Recommendations for the importation of eggs, larvae and pupae of honey bees or bumble bees

~~Competent~~ Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that:

1. the products were sourced from a free country or *zone* free from *A. tumida* infestation (~~under study~~);

OR

- ~~2. have been isolated from queens in a *quarantine station*; and~~
2. the products have been bred and kept under a controlled environment within a recognised establishment which is supervised and controlled by the *Veterinary Authority*;
- ~~3. are from hives or come from hives or colonies which were inspected immediately prior to entry into the *quarantine station* and show no signs or suspicion of the presence of *A. tumida* or its eggs or larvae or pupae then and during the quarantine period.~~
3. the establishment referred to above was inspected immediately prior to dispatch and all eggs, larvae and pupae show no clinical signs or suspicion of the presence of *A. tumida* or its eggs or larvae or pupae, and
4. the packaging material, containers, accompanying products and food are new and all precautions have been taken to prevent contamination with *A. tumida* or its eggs, larvae or pupae.

Article 9.4.8.

Recommendations for the importation of used equipment associated with beekeeping

~~Competent~~ Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that:

1. the equipment:

EITHER

- a) comes from a country or *zone* free from *A. tumida* infestation; and
- b) contains no live honey bees or bee brood;

OR

- c) contains no live honey bees or bee brood; and
- d) has been thoroughly cleaned, and treated to ensure the destruction of *A. tumida* spp., in conformity with one of the procedures referred to in Chapter X.X. (under study);

AND

- 2. all precautions have been taken to prevent infestation/contamination.

Article 9.4.9.

Recommendations for the importation of honey-bee collected pollen and beeswax (in the form of honeycomb)

~~Competent~~ Veterinary Authorities of *importing countries* should require the presentation of an *international veterinary certificate* attesting that:

- 1. the products:

EITHER

- a) comes from a country or *zone* free from *A. tumida* infestation; and
- b) contains no live honey bees or bee brood;

OR

- c) contains no live honey bees or bee brood; and
- d) has been thoroughly cleaned, and treated to ensure the destruction of *A. tumida* spp., in conformity with one of the procedures referred to in Chapter X.X. (under study);

AND

- 2. all precautions have been taken to prevent infestation/contamination.

Article 9.4.10.

Recommendations for the importation of comb honey

Competent Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that the products:

1. comes from a country or *zone* free from *A. tumida* infestation; and
2. contains no live honey bees or bee brood.