

TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

SEPTEMBER 2011 REPORT

CHAPTER 9.4.

**INFESTATION WITH *AETHINA TUMIDA* 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 colonies of *Apis* species, *Bombus* species and stingless bees social bee colonies by the beetle *Aethina tumida*, which is a free-living predator parasite and scavenger affecting bee populations of the honey bee *Apis mellifera* L. It can also parasitise invade bumble bee *Bombus terrestris* and stingless bee *Trigona carbonaria* 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 female beetles can live for at least 6 months and, in favourable reproductive conditions, the female is capable of producing up to a thousand eggs over a lifespan of four to six months 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 and reproduction in the debris may go unnoticed, but the growth of the beetle population is rapid, leading to high bee mortality in the hive. When the bees cannot prevent beetle mass reproduction on the combs, this leads to abandonment and/or collapse of the colony. 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 invading new colonising hives. Dispersal of beetles includes following or accompanying swarms of bees. 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*.

~~When authorising import or transit of the *commodities* covered in the chapter, with the exception of those listed in Article 9.4.2., *Veterinary Authorities* should require the conditions prescribed in this chapter relevant to the *A. tumida* status of honey bee and other social bee population of the *exporting country* or *zone*.~~

Article 9.4.2.

Trade in Safe commodities

When authorising import or transit of the following *commodities*, *Veterinary Authorities* should not require any small hive beetle infestation related conditions, regardless of the *A. tumida* status of the honey bee and bumble bee population of the *exporting country* or *zone*:

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

~~When authorising import or transit of other *commodities* listed in this Chapter, *Veterinary Authorities* should require the conditions prescribed in this Chapter relevant to the *A. tumida* status of the honey bee and bumble bee population of the *exporting country* or *zone*.~~

Article 9.4.3.

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 risk assessment has been conducted, identifying all potential factors for *A. tumida* occurrence and their historic perspective;
24. *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;
32. on-going awareness and training programmes should be in place to encourage reporting of all cases suggestive of *A. tumida* infestation;
34. the *Veterinary Authority* or other *Competent Authority* with responsibility for reporting and control of *diseases* of honey bees should have current knowledge of, and authority over, all domesticated *apiaries* in the country.

Article 9.4.4.

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 9.4.3. 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 9.4.3. and when:

- a) the *Veterinary Authority* or other *Competent Authority* with responsibility for 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 *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 *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 following referred to in Chapter X.X: recommended by the OIE (under study) procedures:
 - i) heating to 50°C core temperature and holding at that temperature for 24 hours, or
 - ii) freezing for 24 hours, or
 - iii) irradiation with 400 Gy;
- 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 9.4.5.

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)

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.

OR

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

~~42. 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~~

23. 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
34. 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
45. 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

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

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

1. the products were sourced from a country or *zone* free from *A. tumida* infestation;

OR

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. the establishment 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

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 following procedures referred to in Chapter X.X. recommended by the OIE (under study):

i) heating to 50°C core temperature and holding at that temperature for 24 hours, or

ii) freezing for 24 hours, or

iii) irradiation with 400 Gy; and

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)

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 following procedures referred to in Chapter X.X. recommended by the OIE (under study):

i) heating to 50°C core temperature and holding at that temperature for 24 hours, or

ii) freezing for 24 hours, or

iii) irradiation with 400 Gy;

AND

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

Article 9.4.10.

Recommendations for the importation of comb honey

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;

OR

3. were frozen subjected to a treatment at a temperature of -12°C or lower in the core of the product during at least 24 hours.