



The British Beekeepers' Association

Examinations Board Syllabus for Module 5: Honey Bee Biology

Applicable for Examinations: March and November 2025

The Candidate shall be able to give a detailed account of, referring to histological features as necessary:

- 5.1 the contributions of R.E. Snodgrass and H.A. Dade to the understanding of honey bee biology.
- 5.2 the alimentary system of the adult honey bee including the process of digestion by enzymes and the absorption and assimilation of the products of digestion.
- 5.3 the excretory system of the adult honey bee and the substances excreted.
- 5.4 the respiratory system of the adult honey bee, including the muscular ventilation of the air sacs, the structure and operation of the spiracles and the exchange of respiratory gases, both at rest and during active flight.
- 5.5 the circulatory system of the adult honey bee, including the heart, dorsal and ventral diaphragms and the composition and functions of haemolymph.
- 5.6 the exocrine glands of both castes and sexes of adult honey bees and larvae, their location, the functions and main compositions of their secretions including pheromones; hypopharyngeal, mandibular, post-genal, Nasonov, poison gland, Koshevnikov, Dufour, Arnhart, post cerebral, thoracic salivary, wax glands, silk glands and tergite glands of the queen (Renner-Baumann).
- 5.7 the different structures of the exocrine glands for the queen, worker and drone.
- 5.8 the structure and function of the nervous system and sense organs of the adult honey bee including the compound eyes, ocelli, organ of Johnston and the sensilla.
- 5.9 the endocrine glands and the functions of their secretions particularly the neurosecretory cells, the corpora allata, corpora cardiaca and the prothoracic glands.
- 5.10 the composition, location and function of the fat body throughout the life cycle of the honey bee.
- 5.11 the reproductive system of the queen and drone and the production of sperm and eggs.
- 5.12 the structure of the egg, development of the embryo within the egg and the hatching of the larva.
- 5.13 the external and internal structure of the honey bee larva.
- 5.14 the metamorphosis of the larva with outline accounts of ecdysis, apolysis, larval defaecation, cocoon spinning, the external anatomy of the pro-pupa, its change to a pupa and then to an imago.
- 5.15 the effect of feeding and other factors on caste determination and the differences between brood food and royal jelly.
- 5.16 the physiological and structural differences between laying workers and normal workers and the role of pheromones in bringing about these differences.

- 5.17 the differences between summer and winter worker honey bees including the role of vitellogenin, juvenile hormone and the fat body.
- 5.18 the structure and main constituents of the cuticle, of the larva and the adult honey bee, with an outline account of its invagination within the body to form linings of the gut and tracheae.
- 5.19 the external anatomy of the queen, worker and drone.
- 5.20 the function and structure of the wings, legs, feet, antennae, mouth parts and setae (hairs).
- 5.21 the structure of the sting mechanism and how this mechanism operates to penetrate human skin and deliver the venom.
- 5.22 the role of the direct and indirect muscles in flight and in the colony.
- 5.23 the structure and function of the exoskeleton of the bee.

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