

UNIVERSITY OF FORT HARE

INSECT BIOLOGY, DIVERSITY
AND ECOLOGY
ZOO 223

SUPPLEMENTARY EXAMINATIONS

JANUARY

2025

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Time: 3 hours

Subject: ZOO 223

Marks: 100

This paper consists of 3 pages including the cover page

Internal Examiners

Dr L Simba
Dr L Heshula
Ms G Tshindekano
Dr RS Nofemela

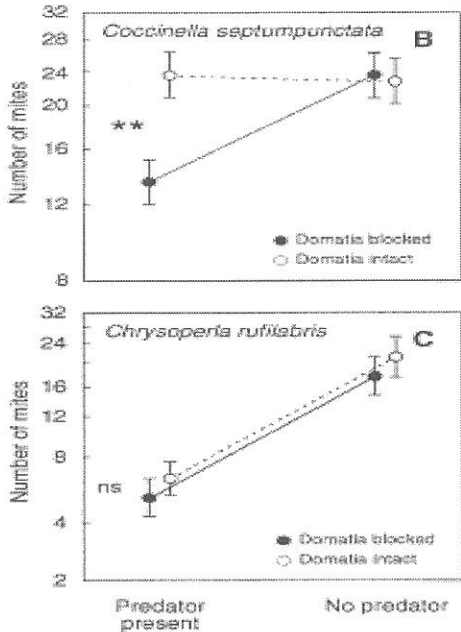
External Examiners

INSTRUCTIONS

1. Answer **ALL** questions.
2. Time management is very important. Allocate your time accordingly (100 marks in 180 minutes).
3. Candidates are encouraged to write answers clearly and legibly

Section A (Dr H – 30 Marks)

1. Discuss the process of moulting in insects (**20 marks**)
2. The graph below shows findings from a 2001 study by Norton et al. The study aimed to assess how the ability or inability of a beneficial mite *Orthotydeus lambi* to access domatia on wild grape plants affected the predation of the beneficial mite. The predators that feed on the mite are the lacewing *Chrysoperla rufilabris* and the ladybird *Coccinella septempunctata*.



- a) Define domatia (**2 marks**).
- b) Investigate Figure B and discuss how access to domatia vs no access to domatia affected the beneficial mite numbers in the presence or absence of the predatory ladybird. (**5 marks**)
- c) Investigate Figure C and discuss how access to domatia vs no access to domatia affected the beneficial mite numbers in the presence or absence of the predatory lacewing. (**3 marks**)

Section B (Dr S – 31 Marks)

1. Define the following terms (**5 marks**)
 - a. Ontogeny
 - b. Myiasis
 - c. Vector competence

- d. Parthenogenesis
 - e. Taxonomy
2. List four strategies of courtship in insect reproduction (**4 marks**)
 3. Briefly explain the difference between ametaboly and hemimetaboly in insect development. (**4 Marks**)
 4. Describe four (4) categories of pathogens transmitted by insects and provide an example of a disease caused by each of the pathogens. (**12 marks**)
 5. Describe three (3) types of myiasis. (**6 marks**)

Section C (Ms G – 16 Marks)

1. Define the following terms:(**5 Marks**).
 - a) Detritivores
 - b) Eclosion
 - c) Parthenogenesis
2. List three (3) morphological adaptations that are found in soil insects. (**3 Marks**)
3. How are termites able to survive feeding on fallen or rotten timber, which is rich in cellulose and lacking vitamins? (**1 Marks**).
4. Explain what sociality is and provide two (2) advantages for social insects. (**3 marks**)
5. Describe any two (2) types of communication in insects. (**4 marks**)

Section D (Dr N – 23 Marks)

1. Define the fundamental and realized niches. (**2 marks**)
2. Describe three (3) competition types found between species. (**3 marks**)
3. List four (4) conservation strategies that can be used to preserve insect biodiversity. (4 marks)
4. Describe three (3) physiological adaptations of insects to harsh environments. (**6 marks**)
5. How would you use the age structure to identify an increasing population size vs. a declining population? (**2 marks**)
6. Explain logistic growth phases in insect populations. (**6 marks**)

