國立臺灣大學99學年度碩士班招生考試試題

一、複選題 (請選出可為害對象及造成的危害)： 6%

1. *Bactrocera dorsalis* (　　)
2. *Ctenocephalides felis* (　　)
3. *Aedes albopictus* (　　)
4. *Bemisia argentifolii* (　　)

A. 果樹；B. 十字花科蔬菜；C. 葫蘆科作物；D. 豆科作物；
E. 貓；F. 鼠； G. 雞；H. 人；I. 禽；
J. 吸血；K. 傳播登革熱；L. 傳播鼠疫；M. 畸果；N. 可傳播病原菌；
O. 蠟粉螺旋狀

二、名詞解釋： 8%

1. cross resistance
2. SIT
3. antibiosis
4. gain threshold

三、 問答題： 21%

1. 請說明 monitor 害蟲對蟲害管理的意義為何？目前政府針對哪些重要害蟲進行 regular monitor？及如何進行？9%

2. 請說明 biopesticides 及 conventional insecticides 的差別並比較台灣及美國 biopesticides 所包含的殺蟲劑類別？寫出 biopesticides 每個類別的定義及台灣已商品化例子每類別各一例。12%

四、問答題：35%

1. 台灣的野生動物保育法將保育類動物再區分成哪幾個類別? 其中分屬於上述各類別的列名保育類昆蟲各有哪些種類? 10%
2. 簡述法醫昆蟲學中擔任分解者角色的昆蟲種類及其消長序列。 5%
3. 請說明下列昆蟲物種之分類地位及其與人類的關係為何? 10%
   (1) *Coptotermes formosanus*
   (2) *Cimex lectularius*
   (3) *Chrysomya megacephala*
   (4) *Bombyx mori*
   (5) *Monochamus alternatus*
4. 請就分類、生態、保育或蟲害防治的觀點討論並舉例說明種群（species group）、亞種（subspecies）及生物小種（biotype）。 10%

見背面

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五、.問答題： 每題十分，共30%

1. 嗅覺是昆蟲尋找同伴、辨識宿主的重要方式之一。昆蟲的觸角（antennae）內含有一種蛋白質，稱之為「氣味結合蛋白」（odorant-binding protein, OBP），OBP 蛋白的研究被認為是下一代害蟲防治的一個標的；試述如何利用 OBP 進行害蟲防治?

2. 昆蟲桿狀病毒是一種桿狀、含有雙股 DNA 基因體的病毒，此病毒除了應用於防治蟲害外，近來也應用於家蠶上，生產基因工程蛋白質，試述台灣以昆蟲桿狀病毒結合家蠶生產基因工程蛋白質之利基或優點。

3. 下面摘要選自一篇文章: Ingested double-stranded RNAs can act as species-specific insecticides，請將其翻譯成中文：

A serious shortcoming of many insecticides is that they can kill non-target species. To address this issue, we harnessed the sequence specificity of RNA interference (RNAi) to design orally-delivered double stranded (ds) RNAs that selectively killed target species. Fruit flies (*Drosophila melanogaster*), flour beetles (*Tribolium castaneum*), pea aphids (*Acyrthosiphon pisum*), and tobacco hornworms (*Manduca sexta*) were selectively killed when fed species-specific dsRNA targeting vATPase transcripts. We also demonstrate that even closely related species can be selectively killed by feeding on dsRNAs that target the more variable regions of genes, such as the 30 untranslated regions (UTRs): four species of the genus Drosophila were selectively killed by feeding on short (<40 nt) dsRNAs that targeted the 30 UTR of the γ-tubulin gene. For the aphid nymphs and beetle and moth larvae, dsRNA could simply be dissolved into their diets, but to induce RNAi in the drosophilid species, the dsRNAs needed to be encapsulated in liposomes to help facilitate uptake of the dsRNA. This is the first demonstration of RNAi following ingestion of dsRNA in all of the species tested, and the method offers promise of both higher throughput RNAi screens and the development of a new generation of species-specific insecticides.