國立臺灣大學101學年度碩士班招生考試試題
題號：467
科目：專業英文(I)
節次：3

★ 第 I, II 大題，請在「非選擇題作答區」作答

I. 中翻英：請將下文中十三個劃底線的粗體中文辭彙翻譯成英文，所有翻譯必須配合其原文文義，以小寫印刷體書寫，潦草者不予計分。所有的辭彙均以名詞回答，必須拼字正確才能得分。

不同生物的生活史**策略**各異，例如：有些植物為**一年生植物**，有些為**多年生植物**；有些動物屬於**單次生殖**，也就是一生當中只生殖一次，另一些則為**多次生殖**，也就是一生當中可生殖許多次；不同生物一個**世代**的時間長短，達到性**成熟**的年齡，不同年齡階段的**生殖力**，也就是生產**子代**的數量也有差異，這些差異都反映出生物對**資源**與能量**配置**上的差異。生活史策略的差異也會影響族群成長的參數，包括**出生率**、**死亡率**等。

中文詞彙之英譯 (每題 2 分)

1. 策略
2. 一年生植物
3. 多年生植物
4. 單次生殖
5. 多次生殖
6. 世代
7. 成熟
8. 生殖力
9. 子代
10. 資源
11. 配置
12. 出生率
13. 死亡率

見背面

II. 英翻中：請將下文中的十二個劃底線的粗體英文辭彙翻譯成中文，所有的翻譯必須配合其原文文義。全部以正楷書寫，潦草者不予計分。

Metapopulations are **assemblages** of local populations inhabiting networks of habitat **patches** in fragmented landscapes. The local populations have more or less independent **dynamics** because of their **isolation**, but complete independence is prevented by large-scale **similarity** in environmental conditions and by **dispersal**, which occurs at a spatial scale characteristic for each species. Metapopulation models are used to describe, analyze, and predict the dynamics of metapopulations. Important questions include the conditions under which metapopulations may persist in particular patch **networks** and for how long, how landscape structure influences metapopulation **persistence**, and the response of metapopulations to changing landscape structure. Metapopulation dynamics in highly fragmented landscapes involves an **extinction threshold**, a critical amount, and spatial **configuration** of habitat that is necessary for long-term persistence of the metapopulation. (cited from "Princeton Ecology")

英文詞彙之中譯 (每題 2 分)

1. **Metapopulation**
2. **Assemblages**
3. **patches**
4. **dynamics**
5. **isolation**
6. **similarity**
7. **dispersal**
8. **networks**
9. **persistence**
10. **extinction**
11. **threshold**
12. **configuration**

III. Multiple choice questions. Select the best answer to the following questions, then write the answer on your Answer Sheet (each 2 points for a total of 50 points) ※ 本大題請於試卷內之「選擇題作答區」依序作答。

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Questions 1-7 are based on the following passage.

Acute effects of anthropogenic sounds on marine mammals, such as from military sonars, energy development, and offshore construction, have received considerable international attention from scientists, regulators, and industry. Moreover, there has been increasing recognition and concern about the potential chronic effects of human activities (e.g., shipping). It has been demonstrated that increases in human activity and background noise can alter habitats of marine animals and potentially mask communications for species that rely on sound to mate, feed, avoid predators, and navigate. Without exception, regulatory agencies required to assess and manage the effects of noise on marine mammals have addressed only the acute effects of noise on hearing and behavior. Furthermore, they have relied on a single exposure metric to assess acute effects: the absolute sound level received by the animal. There is compelling evidence that factors other than received sound level, including the activity state of animals exposed to different sounds, the nature and novelty of a sound, and spatial relations between sound source and receiving animals (i.e., the exposure context) strongly affect the probability of a behavioral response. A more comprehensive assessment method is needed that accounts for the fact that multiple contextual factors can affect how animals respond to both acute and chronic noise. We propose a three-part approach. The first includes measurement and evaluation of context-based behavioral responses of marine mammals exposed to various sounds. The second includes new assessment metrics that emphasize relative sound levels (i.e., ratio of signal to background noise and level above hearing threshold). The third considers the effects of chronic and acute noise exposure. All three aspects of sound exposure (context, relative sound level, and chronic noise) mediate behavioral response, and we suggest they be integrated into ecosystem-level management and the spatial planning of human offshore activities.

1. Which of the followings is not the anthropogenic sound sources on marine mammals? (A) military sonars (B) dam construction (C) offshore construction (D) offshore wind farm development

2. Which of the following taxon groups or species is not marine mammals? (A) Chinese White Dolphin (B) Common Bottlenose Dolphin (C) Fishes (D) Whales

3. What is the potential chronic effect of human activities on marine mammals? (A) Change the food items (B) Alter habitats and potentially mask communications (C) Kill predators (D) Alter foraging behavior

4. According to the paragraph, which of the following is correct? (A) Chronic effects of anthropogenic sounds on marine mammals are considered in human offshore activities. (B) Acute effects of anthropogenic sounds on marine mammals do not receive consideration. (C) The absolute sound level received by the animal is the only focus in current impact assessment of the offshore projects. (D) The proposed new assessment metrics is the ratio of signal to background noise and level above hearing threshold and the ratio does not consider relative sound levels.

5. Which of the followings is not the aspect of sound exposure that mediates behavioral response of marine mammals? (A) Context (B) Relative sound level (C) Chronic noise (D) Frequency

6. According to this paragraph, when we consider the impacts of sound to marine mammals, we should consider (A) measurement and evaluation of context-based behavioral responses of marine mammals exposed to various sounds (B) new assessment metrics that emphasize relative sound levels (C) the effects of chronic and acute noise exposure (D) all of the above

7. The main idea of the paragraph is that (A) marine mammals become endangered due to human activities. (B) the impacts of sound to marine mammals are complex. (C) regulatory agencies required to assess and manage the effects of noise on marine mammals have addressed the acute effects of noise on hearing and behavior. (D) since context, relative sound level, and chronic noise all can mediate behavioral response of marine mammals, they should be integrated into the impact assessment of human offshore development projects.

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Questions 8-13 are based on the following passage.

Agricultural landscapes are becoming an important focus of animal conservation, although initiatives to conserve predators to date have rarely provided economic benefits to agricultural producers. We examined whether introduction to vineyards of the New Zealand Falcon *(Falco novaeseelandiae)*, a species listed as threatened by the New Zealand Department of Conservation, affected the abundance of 4 species of Passeriformes that are considered vineyard pests or affected the amount of economic loss due to grape *(Vitis vinifera)* damage. Three of the species were introduced and remove whole grapes from bunches (Blackbird *[Turdus merula]*, Song Thrush *[Turdus philomelos]*, and Starling *[Sturnus vulgaris])*, whereas the one native species (Silvereye *[Zosterops lateralis])* pecks holes in grapes. The introduction of falcons to vineyards was associated with a significant decrease in the abundance of introduced passerines and with a 95% reduction in the number of grapes removed relative to vineyards without falcons. Falcon presence was not associated with a change in the number of Silvereyes, but there was a 55% reduction in the number of grapes pecked in vineyards with falcons. Our results indicate that, relative to damage in vineyards without falcons, the presence of a falcon could potentially result in savings of US$234/ha for the Sauvignon Blanc variety of grapes and $326/ha for Pinot Noir variety of grapes.

8. Which of the following scientific names is not discussed in the paragraph? (A) *Sousa chinesis* (B) *Zosterops lateralis* (C) *Sturnus vulgaris* (D) *Vitis vinifera*

9. Which of the following Passeriformes is not a vineyard pest in New Zealand? (A) Blackbird (B) Song Thrush (C) Starling (D) Sparrow

10. According to the paragraph, which species is a native species in the study area? (A) *Zosterops lateralis* (B) *Sturnus vulgaris* (C) *Turdus merula* (D) *Turdus philomelos*

11. What is the role of the introduced New Zealand Falcon in the vineyard? (A) A prey (B) A primary producer (C) A predator (D) A decomposer

12. Falcon presence in the vineyard can reduce the number of grapes pecked by Silvereyes, but (A) cannot reduce the number of Silvereyes. (B) increase the number of Blackbird. (C) increase the number of Starling. (D) increase the number of passerines.

13. The presence of a falcon in the vineyard can provide ecosystem services that (A) kill native bird species. (B) control the production of grapes. (C) save money in agriculture production. (D) alter ecosystem function.

Questions 14-19 are based on the following passage.

There is increasing evidence for morphological change in response to 20th century environmental change, but how this relates to fluctuations in geographic range is unclear. We measured museum specimens from two time periods (1902-1950 and 2000-2008) that vary significantly in climate to assess if and how two high elevation contracting species of ground squirrels in the Sierra Nevada of California, Belding's ground squirrel (*Urocitellus beldingi*) and the golden-mantled ground squirrel (*Callospermophilus lateralis*), and one lower elevation, stable species, the California ground squirrel (*Otospermophilus beecheyi*), have responded morphologically to changes in California over the last century. We measured skull length (condylobasal length), an ontogenetically more labile trait, and maxillary toothrow length (MTRL), a more developmentally constrained trait. *C. lateralis* and *U. beldingi*, both obligate hibernators, have increased in body size but have not changed in body shape. In contrast, *O. beecheyi*, which only hibernates in parts of its range, has shown no significant change in either morphometric trait. The increase in body size in the higher elevation species, presumably a plastic effect due to a longer growing season and thus prolonged food availability, opposes the

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expected direction of selection for decreased body size under chronic warming. We hypothesize that population contraction is related to physiological rather than nutritional constraints.

14. According to the paragraph, environmental change in the 20th century has caused a change in species' (A) anatomy. (B) morphology. (C) physiology. (D) taxonomy.

15. Obligate hibernators are individuals undergo hibernation that (A) the physiological state remains constant. (B) can be aroused by external stimuli and are able to sleep for the entire winter. (C) the body temperature drops to near ambient (environmental) temperature, heart and respiration rates slow drastically. (D) the hypothalamic system is damaged.

16. The increase in body size in the higher elevation species is (A) due to a shorter growing season. (B) not related to prolonged food availability. (C) due to higher nutrient contents. (D) in contrast to the expected direction of selection for decreased body size under global warming.

17. Which of the following species is not a hibernator? (A) Formosan Black Bear (*Ursus thibetanus formosanus*) (B) *Callospermophilus lateralis* (C) *Otospermophilus beecheyi* (D) *Urocitellus beldingi*

18. The paragraph strongly suggested that population contraction in ground squirrels is related to (A) nutrition. (B) prolonged food availability. (C) a longer growing season. (D) physiological constraints.

19. The body size increase in high elevation ground squirrels over the last century is probably due to (A) higher temperature. (B) a longer growing season and prolonged food availability. (C) higher precipitation. (D) higher variation in temperature.

Questions 20-22 are based on the following passage.

Most biodiversity is still unknown, and therefore, priority areas for conservation typically are identified based on the presence of surrogates (or indicator groups). Birds are commonly used as surrogates of biodiversity owing to the wide availability of relevant data and their broad popular appeal. However, some studies have found birds to perform relatively poorly as indicators. We therefore ask how the effectiveness of this approach can be improved by supplementing data on birds with information on other taxa. Here, we explore two strategies using (i) species data for other taxa and (ii) genus- and family-level data for invertebrates (when available). We used three distinct species data sets for sub-Saharan Africa, Denmark and Uganda, which cover different spatial scales, biogeographic regions and taxa (vertebrates, invertebrates and plants). We found that networks of priority areas identified on the basis of birds alone performed well in representing overall species diversity where birds were relatively speciose compared to the other taxa in the data sets. Adding species data for one taxon increased surrogate effectiveness better than adding genus- and family-level data. It became apparent that, while adding species data for other taxa increased overall effectiveness, predicting the best-performing additional taxon was difficult. Finally, we demonstrate that increasing overall effectiveness required supplementary data for several additional taxa. Good surrogates of biodiversity are necessary to help identify conservation areas that will be effective in preventing species extinctions. Birds perform fairly well as surrogates in cases where birds are relatively speciose, but overall effectiveness will be improved by adding additional data from other taxa, in particular from range-restricted species. Conservation solutions with focus on birds as biodiversity surrogate could therefore benefit from also incorporating species data from other taxa.

20. Current selection of priority areas for conservation is based on (A) birds. (B) indicator groups of species. (C) mammals. (D) endangered species.

見背面

21. Speciose can be defined as (A) large data sets. (B) indicator species. (C) a surrogate for birds. (D) a taxon that contains many species.

22. Why birds are used as surrogates for selecting priority conservation areas? (A) The high species richness. (B) The higher trophic level. (C) The wide availability of relevant data and their broad popular appeal. (D) The colorful feathers and large body size.

Questions 23-25 are based on the following passage.

Current climate change is supposed to be beneficial to many biological invaders, especially to C4 alien plants. While several experiments have been dedicated to measuring alien plants' response to increased atmospheric CO_2 concentration, very few studies have been undertaken to measure the response of alien plants to warming. This study was aimed to test experimentally whether the predicted climate change in the Mediterranean Basin could be beneficial to the alien C4 grass *Setaria parviflora* (Poir.) Kerguélen. Three populations of *S. parviflora* from Corsica, southern France, were grown in Montpellier, southern France. The C4 alien grass *S. parviflora* was exposed to artificial climate change conditions for 3 years in open field and in competition with the local native community. We measured the response to artificial warming of +1.5 and +3 °C and artificial drought (−30% precipitation) versus ambient conditions for phenology, biomass and fecundity of *S. parviflora*. We compared the response of *S. parviflora* individuals to the response of the local community. Artificial warming strongly enhanced the biomass and the fecundity of *S. parviflora*, while it decreased or did not affect the biomass and fecundity of the local community. The phenology of *S. parviflora* was advanced significantly and explained the changes observed in biomass and fecundity. Here, we report a positive effect of climate change on the growth and fertility of *S. parviflora*, a C4 alien plant. Our results suggest that climate change predicted for the next decades in the Mediterranean Basin might substantially enhance the performance of *S. parviflora*, potentially increasing its invasion success.

23. Where is the study conducted? (A) North America. (B) Europe. (C) Asia. (D) South America.

24. The 'phenology' is used to describe (A) onset of reproduction. (B) onset of mating. (C) onset of new leaves. (D) onset of growth, first spike pollinating and fruit ripeness.

25. What is the main finding of this study? (A) The phenology of *S. parviflora* was advanced less significantly. (B) Climate change might have a negative effect on the growth of *S. parviflora*. (C) Climate change might increase the invasion potential of *S. parviflora*. (D) Climate warming strongly enhanced the biomass and the fecundity of *S. parviflora*.

試題隨卷繳回