

- 8 (a) Palm oil is the most widely used vegetable oil. It is obtained from the African oil palm, *Elaeis guineensis*. Oil palms are the highest yielding vegetable oil crop, needing only 10% of the land area required by other crops to produce the same quantity of oil.

On the island of Borneo, tropical rainforests are cut down and cleared to create oil palm plantations. This has a large effect on biodiversity.

The Bornean orangutan, *Pongo pygmaeus*, is only found on the island of Borneo and is classified as critically endangered on the International Union for Conservation of Nature (IUCN) Red List of Threatened Species™.

Fig. 8.1 shows Bornean orangutans.



Fig. 8.1

Suggest ways in which the Bornean orangutan may be conserved.

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- (b) Biodiversity can be assessed at different levels.

Outline the main levels at which biodiversity can be assessed.

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TABLE 401



- (b)** *G. fortis* also lives on Santa Cruz, another island in the Galápagos.

Most of the seeds available for *G. fortis* to eat on Santa Cruz are either small or large. There are few intermediate sizes of seed.

Fig. 5.3 shows the distribution of bill size in the *G. fortis* population on Santa Cruz.

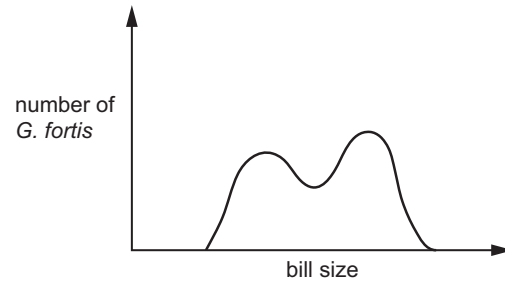


Fig. 5.3

Explain how natural selection in the *G. fortis* population on Santa Cruz has resulted in the distribution in bill size shown in Fig. 5.3.

[4]

- (c) Scientists studied the effect of an increase in the number of tourists each year on the number of invasive alien species present in the Galápagos islands.

The scientists recorded the number of invasive alien species present each year in the Galápagos islands over many years. The scientists also recorded the number of tourists visiting the islands each year.

Fig. 5.4 shows a graph of the data for five different years during the study.

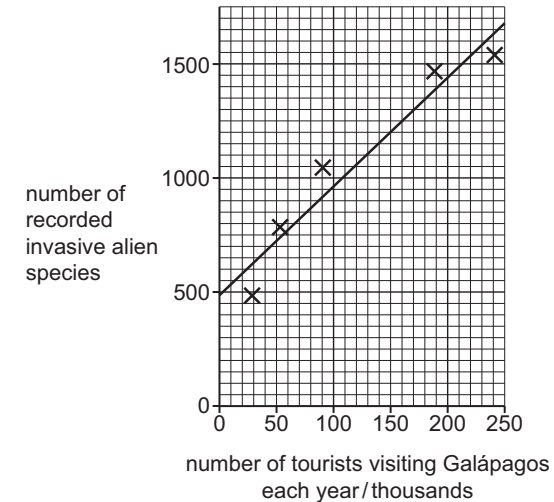


Fig. 5.4

- (i) The scientists carried out a Pearson's linear correlation calculation for the data in Fig. 5.4.

The scientists calculated an r value of 0.930.

The scientists concluded that there is a significant correlation between the number of tourists visiting the Galápagos islands each year and the number of invasive alien species present.

Table 5.1 shows a probability table of critical values for Pearson’s linear correlation.

Table 5.1

number of observations	probability level (<i>p</i>)	
	0.05	0.01
3	0.997	1.000
4	0.950	0.990
5	0.878	0.959
6	0.811	0.917
7	0.754	0.875

With reference to Table 5.1, explain why the *r* value of 0.930 indicates that there is a significant correlation between the number of tourists and the number of invasive alien species.

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(ii) Invasive alien species are thought to have contributed to extinctions recorded in the Galápagos islands.

Discuss the negative effects of introducing invasive alien species to an ecosystem.

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(iii) State **two** factors, other than competition and the introduction of invasive alien species, that can cause extinction.

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