Small carnivores contribute to rat control in oil palm plantations

In Southeast Asia, rats can cause severe damage in oil palm plantations. Barn owls are commonly used by agro-industries to reinforce rat control. However, in some plantations, rat damage (hence population size) remains substantial. What might explain such population differences? Could small carnivores play a role as predators?

1- Two sites compared in Indonesia

Large-scale plantations (4,000 - 5,000 ha)

- Riau Site - 2 plantations
  - Barn owls
  - Low rat damage
  - No rodenticide (> 10 years)

- Bangka Site - 2 plantations
  - Barn owls
  - High rat damage
  - High rodenticide (> 10 years)

Sampling

- Dry seasons 2010 - 2011 - 2012
- Diversity and abundance of small carnivores:
  - 478 km covered for faeces counts
  - 3,000 km for spotlight counts
- Small carnivore community diet:
  - 159 faeces analyzed
  - 311 food items identified

2- Results: small carnivores, notably leopard cats, may well enhance rat control

Small carnivore diversity

- Leopard cat over-dominant in Riau, whereas absent in Bangka
- Small carnivore community more diverse in Riau (Simpson Index)

Small carnivore abundance versus rat damage

- 2 to 10 times more small carnivores in Riau
- The larger the number of small carnivores, notably leopard cats, the lower the rat damage

Small carnivore diet (data not shown)

Less plant material in the diet of the small carnivores in Riau (frequency of occurrence in faeces: 51.1% in Riau and 30.9% in Bangka; p=0.035) …which is consistent with small carnivore community composition

3- Questions arising

- Is predation by small carnivores a necessary condition to limit rat populations?
- Does rodenticide have the opposite effect to the one intended?
  - indirect intoxication of barn owls and small carnivores
  - real effect of rodenticide on rat population (rat resistance)

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