

Rat Lung Worm Disease Scientific Workshop, August 16-18, 2011

Definitive, intermediate, paratenic, and accidental hosts of *Angiostrongylus cantonensis*, and its molluscan intermediate hosts in Hawaii

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Definitive hosts

- Obligatory to life cycle
- Larvae mature and reproduce in these hosts

Rattus norvegicus



Rattus exulans



Rattus rattus





Intermediate hosts

- Obligatory to life cycle
- Larvae mature and can persist, sometimes for the entire life of the host

Achatina fulica

Photo: David Preston

Subulina octona





Pomacea canaliculata

Bradybaena similaris

Veronicella cubensis



Paratenic hosts

- Not obligatory to life cycle
- Larvae do not mature or reproduce in these hosts
- Can infect definitive, accidental or other paratenic hosts





Accidental hosts

- Not obligatory to life cycle
- Dead end for the parasite larvae do not reproduce in these hosts, but die
- Can often cause sickness or death





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Domestic animals







Endangered and vulnerable species



Cotton-top tamarin

Grey-headed fruit bat



White-handed gibbon



Human Health Concern

Posted on: Sunday, February 8, 2009



Disease outbreak on Big Island raising alarm among residents

Big Isle parasite victims emerge from their comas Star Bulletin

Monday, March 23, 2009

POSTED: 01:30 a.m. HST, Mar 21, 2009

Research objectives

 Document the geographic distribution of Angiostrongylus cantonensis in Hawaii

 Identify the vectors of this parasitic nematode

Methods

- Specimens
 - Survey material collected 2004-10
 - 237 sites across the Hawaiian Islands
 - ->21,000 specimens
- Molecular approach

 Angiostrongylus-specific
 primers (Qvarnstrom et al. 2007)





Previously shown to be carriers

Achatina fulica





Deroceras laeve



Laevicaulis alte

Parmarion martensi



Deroceras reticulatum Paropeas achatinaceum Subulina octona



Veronicella cubensis



Bradybaena similaris





Cornu aspersum







Pomacea canaliculata



Not yet shown to be carriers

Oxychilus alliarius



Kaala subrutila







Philonesia sp.



Sampling Sites

(%) Kauai (*n* = 16)

Oahu (*n* = 36)

Molokai (*n* = 9) Maui (*n* = 30) Lanai (*n* = 4)

50 km

130 sites screened so far out of the total of 237 sites from which we have material Hawaii (n = 36)

Geographic distribution Angiostrongylus cantonensis

• Oahu, Hawaii, Kauai, Maui and Molokai (not recorded on Lanai but few samples screened)

Higher prevalence in windward areas



13 out of 16 species tested positive

Most land and freshwater snails and slugs could act as hosts

Caenogastropoda

Pulmonata

Modified from Barker 2001

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Workshop organizers