

DAVID Y. IGE
GOVERNOR OF
HAWAII



**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES**

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

**Testimony of
SUZANNE D. CASE
Chairperson**

**Before the House Committee on
FINANCE**

**Tuesday, February 27, 2018
12:00 PM
State Capitol, Conference Room 308**

**In consideration of
HOUSE BILL 474, HOUSE DRAFT 1
RELATING TO RAT LUNGWORM DISEASE**

House Bill 474, House Draft 1 proposes to appropriate funds to the University of Hawaii at Hilo to support research relating to rat lungworm disease. **The Department of Land and Natural Resources (Department) supports this measure provided that its passage does not replace or adversely impact priorities indicated in the Executive Supplemental Budget request.**

The Department recognizes the threat of rat lungworm disease and the lack of information on statewide distribution of the parasite *Angiostrongylus cantonensis* and its hosts. The Department also notes that the Hawaii Invasive Species Council (HISC), which is administered by the Department, received proposals for research and education to address this disease in Fiscal Years 16 and 17, but was unable to identify adequate resources to support all of the proposed efforts. Additional funding support for a more comprehensive research program, as described in this measure, would be strongly beneficial for the protection of public health and the local agricultural industry.

Thank you for the opportunity to comment on this measure.

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

DAVID Y. IGE
Governor

DOUGLAS S. CHIN
Lt. Governor



SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512
Phone: (808) 973-9600 FAX: (808) 973-9613

TESTIMONY OF SCOTT E. ENRIGHT
CHAIRPERSON, BOARD OF AGRICULTURE

BEFORE THE HOUSE COMMITTEE ON FINANCE

FEBRUARY 27, 2018
12:00 P.M.
CONFERENCE ROOM 308

HOUSE BILL NO. 474 HD1
RELATING TO RAT LUNGWORM DISEASE

Chairperson Luke and Members of the Committee:

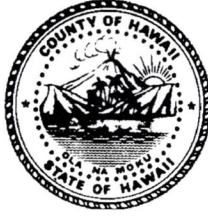
Thank for the opportunity to testify on House Bill No. 474 HD1, relating to rat lungworm disease. The Department supports the intent of this measure and defers to the University of Hawaii on carrying out the bill's mandates and appropriations.

Rat lungworm disease is a serious and relatively new pathogen to plague the consumption of fresh produce grown in the islands. There is a great need to conduct research into the biology of the carriers of the disease, the ways in which it can be spread, outreach to the public in understanding the condition, and methods that can be employed to control and/or contain it.

Thank you for the opportunity to testify on this measure.



Harry Kim
Mayor



Wil Okabe
Managing Director

Barbara J. Kossow
Deputy Managing Director

County of Hawai'i
Office of the Mayor

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February 26, 2018

Representative Sylvia Luke, Chair
Committee on Finance
Hawai'i State Capitol, Room 308
Honolulu, HI 96813

Representative Ty J.K. Cullen, Vice-Chair
Committee on Finance
Hawai'i State Capitol, Room 308
Honolulu, HI 96813

Dear Chair Luke, Vice-Chair Cullen and Committee Members:

Re: HB 474, HD 1 Relating to Rat Lungworm Disease
Hearing Date: 02/27/18 – 12:00 pm; House Conference Room 308

Thank you for this opportunity to testify in support of funding for activities aimed at the prevention and eradication of rat lungworm disease. Until those goals have been achieved, a third worthy aim of the bill, clearly reflected in the amendments (although not specified in the preamble) is better treatment for those who fall victim to this illness.

The Daniel K. Inouye College of Pharmacy at the University of Hawai'i at Hilo established the Hawai'i Island rat lungworm disease working group. It has been conducting research and educational outreach on the disease for the past four years, and it is my understanding that it has been doing very valuable work.

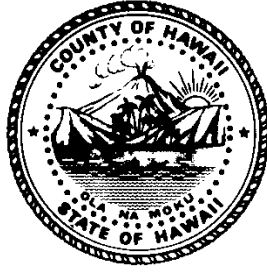
Apparently the impact of this disease has been different in Hawai'i than on the mainland, with unusually severe consequences reported for Hawai'i victims. Therefore, the funding of local research is uniquely important.

I leave to others whether requiring 1:1 matching funds is realistic, but in any case I urge you to support a generous appropriation to deal with this dreadful disease.

Respectfully submitted,


Harry Kim
Mayor, County of Hawai'i

JEN RUGGLES
Council Member
District 5 – Puna Mauka,
Pahoa Mauka, Kalapana



*Public Works & Parks and Recreation
Committee Chair
Public Safety & Mass Transit
Committee Chair*

Phone: 808-961-8263
Fax: 808-961-8912
Email: Jen.Ruggles@hawaiicounty.gov

*Hawai'i County Building
25 Aupuni St. Suite 1402
Hilo, HI 96720*

HAWAI'I COUNTY COUNCIL

February 26, 2018

Re: HB 474 relating to Rat Lung Worm Disease

Dear Chair Luke and Members of the Committee on Finance,

Hawaii Island desperately needs funding for Rat Lung Worm Disease, (RLWD). The district of Puna is most affected, and in fact, now has a regular support group of 30-50 survivors who share their horrific stories of feeling pain described as somewhere between electrocution and being on fire. This pain affects a different area of the body every few days. This symptoms last months, and sometimes do not go away. It is also a common story that the RLWD victims lose their careers and go into debt.

Due to the lack of funding last legislative session, Hawaii County Council pooled our contingency relief funds and were able to fund the initial study by the UH College of Pharmacy that establishes conducts a bioassay needed to determine if the larvae or dead or alive. Once this is complete, the UH College of Pharmacy will be able to research the following:

1. Safe vegetable washes,
2. Anti-parasitic drugs and;
3. Water catchment filters.

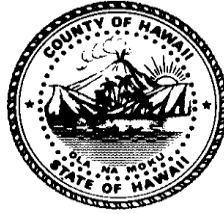
The cost of these studies will be than our contingency funds can cover. These studies will be critical to allow people to prevent and treat RLWD, and thus, critical future of our islands health, safety, and reputation world-wide. Please ensure these crucial studies may be completed and support HB 474.

Thank you for this opportunity to testify.

Sincerely,

A handwritten signature in cursive script that reads "Jen Ruggles".

Eileen O'Hara
Council Member
Council District 4



Phone: (808) 965-2712
Fax: (808) 961-8912
Email: eileen.ohara@hawaiicounty.gov

Chair: Environmental
Management Committee

Vice Chair: Planning Committee and
Agriculture, Water & Energy
Sustainability Committee

County of Hawaii
Hawaii County Council

25 Aupuni Street, Suite 1402 • Hilo, Hawai'i 96720

Representative Sylvia Luke
Chair, House Committee on Finance
Hawai'i State House of Representatives

February 23, 2018

Re: In Support of House Bill 474, from Hawai'i County Council District 4
To be heard by FIN on Tuesday, 02-27-18 12:00PM in House conference room 308

Aloha Chair Luke and Committee Members:

I'm writing to express my support for House Bill 474, which appropriates funds to the University of Hawai'i at Hilo, the Department of Health, Department of Land and Natural Resources, and Department of Agriculture for programs, studies, and activities related to rat lungworm disease.

Further research, treatment, prevention, and education efforts are desperately needed for all of those living with, or at risk of, contracting this devastating disease. Since the disease has come to Hawai'i from Asia, its effects have become more virulent and severe. The disease has also been found in Florida and a case was recently diagnosed in Tennessee. Without aggressive research, there is potential for rat lungworm to spread to other mainland locations.

Local institutions like the University of Hawai'i at Hilo, College of Pharmacy, are already equipped to conduct the necessary research to gather critical information about this disease. Incidences of it are grossly understated, and this research could provide more rapid diagnoses that would allow us to provide acute care in the early onset and prevent serious permanent disabilities. Diligent and effective treatment at this phase would save a tremendous amount of tax payer money required to provide long term care for individuals who have been affected by the disease.

I do not hesitate to support any measure to research and prevent rat lungworm. Please consider the important impacts that passing this bill will have on our economy and health, and contact me if you have any questions about my support or knowledge of the subject.

Sincerely,

Eileen O'Hara
Council Member
Council District 4



UNIVERSITY OF HAWAII SYSTEM

Legislative Testimony

Testimony Presented Before the
House Committee on Finance
February 27, 2018 at 12:00 pm

By

Carolyn Ma, PharmD, BCOP
DEAN

UH Hilo - Daniel K. Inouye College of Pharmacy

HB 474 HD1 – RELATING TO RAT LUNGWORM DISEASE

Chair Luke, Vice Chair Cullen, and members of the committee:

My name is Carolyn Ma, and I am the Dean for the UH Hilo Daniel K. Inouye College of Pharmacy (DKICP). As designated lead for UH Hilo and on behalf of Interim Chancellor Marcia Sakai, the University of Hawai'i at Hilo fully supports this bill that will address the research to control and treatment of Rat Lung Worm (RLW) Disease.

UH Hilo's DKICP has both a basic science researcher and a pharmacy practice (pharmacist) faculty on the RLW Working Group.

A most recent study (in publication) has shown that Hawaii Island has the highest *Angiostrongylus cantonensis* infection rates in rats (94%) and in mollusks (*Parmarion martensi*, semi-slugs 77%) in the country and the increase in human infection appears linked to the arrival of semi-slugs. A baseline recent study conducted on Kauai, between March-May 2017 and tested for the presence of *Angiostrongylus cantonensis* (Rat Lungworm), of which 17.2% of semi-slugs tested positive. Our basic science researcher has been active in conducting valuable research.

1. Jarvi lab has developed a 'death assay' to distinguish live from dead larvae. Continued study in this area will help complete studies determine how effective commercially available vegetable washes or other solutions are at killing infective RLW larvae.
2. Simulated catchment water systems have been initially conducted to test two different size filters in an attempt to filter out infective larvae. However, tests have shown that larvae can still travel or move around certain size filters. Continued evaluation of the possibility of RLW transmission in water is necessary by conducting laboratory and household catchment studies to optimize maintenance and treatment design that prevents RLW larvae entering household and agricultural water supplies.

3. A pilot study has been completed to determine if a blood-based test can help to diagnose RLW, rather than the current diagnosed procedure of a spinal tap. Continued study of protein isolates from infected rats will help to evaluate the reliability and validity of such a test.
4. The lab continues to develop ways of reducing larval burdens in rats. Vaccination study was unsuccessful under given conditions. Further study in possibly deworming rats may be a more appropriate strategy.

Our Pharmacy Practice faculty has been working with Dr. John Martell and the RLW workgroup subcommittee for clinical management to elucidate treatment guidelines. This would entail developing disease risk factors, best treatment, and clinical follow up. The clinical management subcommittee is performing a retrospective chart review to better understand the treatment scheme and outcomes of the 80+ cases of RLW that have occurred in Hawai'i. Funding would help to continue this investigation and further study to determine the most effective medical treatment for the various stages of RLW in humans, domesticated animals and farm livestock.

UH Hilo supports this bill if the passage does not replace or adversely impact priorities as indicated in our University of Hawai'i BOR Approved Supplemental Budget.



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February 27, 2018

HEARING BEFORE THE
HOUSE COMMITTEE ON FINANCE

TESTIMONY ON HB 474, HD1
RELATING TO INVASIVE SPECIES

Room 308
12:00 PM

Aloha Chair Luke, Vice Chair Cullen, and Members of the Committee:

I am Randy Cabral, President of the Hawaii Farm Bureau (HFB). Organized since 1948, the HFB is comprised of 1,900 farm family members statewide, and serves as Hawaii's voice of agriculture to protect, advocate and advance the social, economic and educational interests of our diverse agricultural community.

The Hawaii Farm Bureau supports, with comments, HB 474, HD1, which appropriates funds to the University of Hawaii at Hilo for testing, studies, outreach, research, and other activities related to the prevention and eradication of rat lungworm disease.

Providing safe and wholesome food is a priority for the Farm Bureau and its members. Unfortunately, not enough is currently known about Rat Lungworm Disease, or angiostrongyliasis, to fully protect the public. For example, although we know that people in Hawaii can get the disease by eating food contaminated by the larval stage of *A. cantonensis* worms found in raw or undercooked snails or slugs, and we know that people have also become infected by eating raw produce that contains a small infected snail or slug, or part of one, it is *not* known whether even just the slime left by infected snails and slugs is able to cause infection.

This is critical information since the disease can cause a rare type of meningitis (eosinophilic meningitis) that is extremely painful, debilitating, and can be deadly. Because there is no specific treatment for the disease, patients are only given supportive therapy and pain medication.

As more people are encouraged to grow their own food in backyard gardens, and school gardens are becoming more prevalent, the risk of being infected with this disease increases. Nutritionists advise the public to eat plenty of fresh leafy

However, without knowing enough about the transmission of rat lungworm disease, this advice may be risky in areas infested by snails and slugs, unless proper preventative measures are taken. The public needs to know what pre-consumption measures will prevent transmission. Backyard gardeners and others who may not practice pest management to effectively control snails and slugs, or those who purchase greens from these sources, may be particularly at risk.

HFB supports funding of the University of Hawaii at Hilo for research related to the rat lungworm disease, however, we prefer the language in HB 2140, HD1 which proposes a comprehensive and collaborative strategy for the prevention and eradication of rat lungworm disease

Thank you for the opportunity to provide testimony on this measure.



23 E. Kawili St, Hilo, HI 96720 • Phone: (808) 933-3340

TESTIMONY OF THE BIG ISLAND INVASIVE SPECIES COMMITTEE
SUPPORTING H.B.474, RELATING TO RAT LUNGWORM DISEASE
HOUSE COMMITTEE ON FINANCE
TUESDAY, FEBRUARY 28, 2018. 12:00 PM. ROOM 308

The Big Island Invasive Species Committee (BIISC) is a partnership of private citizens and public agencies working to address invasive species issues on the island of Hawaii. Our mission is to prevent, detect, and control the highest risk invasive species threats to the Big Island environment, economy, and way of life.

DEAR CHAIR LUKE AND VICE-CHAIR CULLEN:

The Big Island Invasive Species Committee strongly supports HB 474. Funding for research and education on rat lungworm disease is essential in the state of Hawaii. Cases of rat lungworm disease in Hawaii have been increasing in number and severity in recent years, costing people their lives, livelihoods, savings, health, and well-being, and fear that the disease is inadequately managed, that knowledge of best practices is still developing, is having an impact on local farms.

Research into the proper management of rat lungworm disease is crucial to Hawaii's efforts to become food secure. The priorities for rat lungworm disease research and education outlined in this bill must be addressed in order to ensure that the health and mental well-being of Hawaii's residents and visitors are protected. Right now too many of the practices recommended are based on good sense, not hard evidence about effectiveness. Ignoring these information gaps will limit the effectiveness of interventions, which will in turn hurt our farmers, our residents and visitors, and Hawaii's reputation as a tropical vacation paradise. We appreciate the recognition in this bill that the effort is multi-dimensional, demonstrated by the intent to fund each participating agency, and hope that whatever appropriation is made is adequate to making real progress in each area.

Mahalo for your time and consideration.

HB-474-HD-1

Submitted on: 2/24/2018 3:24:04 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Christy Martin	Coordinating Group on Alien Pest Species (CGAPS)	Support	No

Comments:

Aloha,

CGAPS is in support of direct funding to support research on prevention, detection, and treatment of rat lungworm. One comment on the HD1 insertion of the condition, "to conduct laboratory testing to determine the effectiveness of deworming rats": even if a technique is found to effectively deworm or kill the parasite in a lab rat does not mean that such a procedure could be conducted on millions of wild rats. Mahalo for your consideration.

HB-474-HD-1

Submitted on: 2/25/2018 7:44:58 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Sylvia Dolena	Pele Lani Farm LLC	Support	No

Comments:

Serious funding for serious research. If this does not happen, no will buy our crops.

We need to find a solution to those who are suffering from this parasite AND also find a sane solution to eradication.

HB-474-HD-1

Submitted on: 2/24/2018 9:58:39 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Ronald S. Fujiyoshi	Ohana Ho`opakele	Support	No

Comments:

Thank you for the opportunity to testify in this manner!

I live in Hilo and know personally two individuals who have been stricken by rat lung disease.

I am a small farmer with an acre of macademia nuts. It is not clear what is the real cause of the rat worm lung disease. I mean, there is not yet enough research to know whether the worst danger is coming from: 1) the rats themselves, 2) infection in water catchment, 3) snails like the African snails, or 4) the tiny slugs on green leaves of vegetables. We definitely need more research here on the Big Islands. Please fund the UH of Hilo that is already doing research on the cause(s) of rat lung disease.

Mahalo for reading this!

HB-474-HD-1

Submitted on: 2/23/2018 8:10:35 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Ronald Taniguchi, Pharm.D.	Individual	Support	No

Comments:

HB-474-HD-1

Submitted on: 2/24/2018 11:34:09 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
elizabeth hansen	Individual	Support	No

Comments:

Aloha - it is critical for the legislature to fund the RESEARCH at UHH College of Pharmacy. We must get this funding passed this year for research. Too much is at stake for the public health. This is not a short term illness - has long reaching medical and pain ramifications. Please pass funding for this bill.

Appreciate your support.

Elizabeth Hansen,

Hakalau HI 96710

HB-474-HD-1

Submitted on: 2/24/2018 11:36:19 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Rodger Hansen	Individual	Support	No

Comments:

Aloha - I appreciate your support on this bill. it is critical for the legislature to fund the RESEARCH at UHH College of Pharmacy. We must get this funding passed this year for research. Too much is at stake for the public health. This is not a short term illness - has long reaching medical and pain ramifications. Please pass funding for this bill.

Rodger Hansen

Hakalau HI 96710

HB-474-HD-1

Submitted on: 2/24/2018 1:05:00 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
M. Kathleen Howe	Individual	Support	No

Comments:

I am asking all of you on this committee to support and pass HB 474. Research is crucial to deal with this problem that only grows larger for Hawaii. Anyone who thinks just washing your veggies is going to cut it when 94% of 545 wild rats trapped in Hilo show current or previous signs of infection is out of their mind. The hammer is going to come down on Hawaii, tourists are getting it and one day you all are going to have some explaining to do. I support HB 474.

HB-474-HD-1

Submitted on: 2/24/2018 2:41:14 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Una Greenaway	Individual	Support	No

Comments:

Chair Luke, Vice Chair Cullen and committee members;

I am writing to implore you to PLEASE fund this research at UH Hilo. the folks there have dedicated many years now working on this terrible, terrible disease. they have been working on a blood test and desperately need these funds to complete their research. Right now, if someone suspects they have RLWD, they must subject themselves to a spinal tap, adding insult to injury. More pain when they are already in pain. A blood test is needed and will make diagnosis much easier and cost effective.

thank you for you consideration of this funding.

Mahalo, Una Greenaway

HB-474-HD-1

Submitted on: 2/24/2018 3:26:49 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
seny bynum	Individual	Support	No

Comments:

I live on the hamakua coast where this disease is progressing geographically and exponentially making it difficult to ensure that the produce we are feeding our families(whether purchased or self produced) is safe- especially for those of us growing organically to try and restore soils depleted by the cane growers

please fund the research needed to understand this problem so we can eat more safely

thank you

HB-474-HD-1

Submitted on: 2/24/2018 3:48:36 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
George Curtis	Individual	Support	No

Comments:

Please confirm this important health measure. It can affect you and your family.

HB-474-HD-1

Submitted on: 2/24/2018 4:19:05 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Mary True	Individual	Support	No

Comments:

Please give generous support to help us out with our rat lung disease problem on Hawaii Island. It is a serious issue which we need to get a handle on through research and education. Mahalo!

HB-474-HD-1

Submitted on: 2/24/2018 9:52:28 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Scott Crawford	Individual	Support	No

Comments:

HB-474-HD-1

Submitted on: 2/24/2018 11:06:45 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Cory Harden	Individual	Support	No

Comments:

Aloha legislators,

Please support action on rat lungworm. Two of my friends got it. One had to move the the states to get ongoing medical care, and the other has permanent tingling in his limbs. As for me, like many, I'm on catchment and need to know how to protect myself.

mahalo,

Cory Harden, Hilo

HB-474-HD-1

Submitted on: 2/25/2018 1:12:09 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Shannon Rudolph	Individual	Support	No

Comments:

Strongly Support... shoulda been done last year!

HB-474-HD-1

Submitted on: 2/25/2018 4:59:04 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Kristin Regrutto	Individual	Support	No

Comments:

To whom it may concern,

ease help protect our community and our children by supporting HB 474.

Thank you

HB-474-HD-1

Submitted on: 2/25/2018 7:34:25 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Joan Gannon	Individual	Support	No

Comments:

To: Finance Committee meeting on 2/27/18 12 noon at room 308

Re: HB 474 about rat lung research and funding to support the research. I ask please pass this bill. The rat lung disease is causing great worry and concern here on Hawaii Island. We have the resources to find a way to fight this disease. Now we need the finance support to do the job.

Thank you for your consideration

Joan Gannon Hawaii Island resident

HB-474-HD-1

Submitted on: 2/25/2018 10:24:11 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Neal Herbert	Individual	Support	No

Comments:

HB-474-HD-1

Submitted on: 2/25/2018 10:42:36 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Javier Mendez-Alvarez	Individual	Support	No

Comments:

HB-474-HD-1

Submitted on: 2/25/2018 10:51:48 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Karen Maclsaac	Individual	Support	No

Comments:

Please vote yes to support this bill. More studies must be done to treat and eradicate this horrible disease that affects residents and tourists alike. It affects a victim's health profoundly both acutely and chronically, and it affects our agriculture, and eventually the economy. It cannot be left unstudied to spread throughout the islands.

HB-474-HD-1

Submitted on: 2/25/2018 11:18:21 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Richard Reed	Individual	Support	No

Comments:

This bill is not only critically important for reducing the effects of infection but also for reducing the fear of eating anything grown in Hawaii. Saddle slugs travel as much as 6-8 feet up trees at night so even tree fruit is suspect. I can see usefulness in all the research paths listed except the first, deworming rats, which seems much harder to ever achieve than even total rat eradication which I also doubt is achievable. Eradicating any one link in the vectors of this plague would do the trick but a lot of research needs to be done. Please fund this effort.

HB-474-HD-1

Submitted on: 2/25/2018 11:36:09 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Theresa Loving	Individual	Support	No

Comments:

I have known three BI residents that have contracted rat lung worm. The debilitating and long term effects of this disease are serious and life changing. As a resident, I have been disturbed by the lack of information being broadcast to warn both residents and visitors of this terrible disease and how to take every safeguard to prevent it. I have watched hours of video testimony as Dr. Susan Jarvi and Kaye Howe gave information to the county council. I have spoken to university staff that were concerned with the possibility that the disease can be contracted through water in water catchman tanks of which the Big Island has many. It is apparent to me that the UH Hilo researchers are the most informed and prepared to continue with the rat lung research that needs to be done. I would like for them to receive as much funding as possible to work on understanding and potentially eradicating this awful disease.

HB-474-HD-1

Submitted on: 2/25/2018 3:41:17 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
JeanE Monnier	Individual	Support	No

Comments:

Having witnessed the devastating effects of rat lungworm on a friend I believe this is a critical health issue that must receive public funding.

HB-474-HD-1

Submitted on: 2/25/2018 3:55:16 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Peter Altomare	Individual	Support	No

Comments:

The dangerous problem of "Rat Lung Disease" has to be, once and for all, permanently confronted and means of prevention, diagnosis and prevention established.

A group of researchers with expertise in the issues of "Rat Lung Disease" already exists at UH Hilo, and should be funded and supported for the needed period of time to arrive at a solution

That solution is urgently needed assure the health and safety of our citizens, residents, visitors and tourists. Further delay would be unjustifiable and dangerous.

I therefor very strongly support the passage and implementation of HB 474 HD1 with the strongest, clearest language to permanently and effectively end this public health danger.

HB-474-HD-1

Submitted on: 2/25/2018 7:28:26 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Marion McHenry	Individual	Support	No

Comments:

We need to support research on this disease in our state.

HB-474-HD-1

Submitted on: 2/26/2018 12:58:03 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Lela Kalama	Individual	Support	No

Comments:

Aloha!

RLW is a serious parasite that can devastate and even end lives! We deserve this funding so that we can have the knowledge and tools to better protect ourselves. I think about this daily and have taught my kids about the dangers!! They fear the semi slug and tell us when they see one. I STRONGLY SUPPORT THIS BILL!!! Please pass this Bill!

mahalo nui,

Lela Kalama

Resident in Puna, HI

Testimony in Support of HB 474, HD 1
House Finance Committee Hearing, February 27, 2018

Aloha Chair Luke and Members of the House Finance Committee:

My name is Susan Forbes and have lived in Hakalau on the Hamakua Coast of the Big Island for the past seven years. Prior to that I lived on Oahu for forty three years.

I'm submitting this testimony in support of H.B. 474, HD 1. Rat lungworm disease poses a serious threat to our health, to the Big Island's food sustainability, to the safety of our drinking water in catchment systems, and to our tourism-based economy. While the Big Island is the epicenter, the disease can be spread to other islands. You know all this, of course. Please understand that as an East Hawaii Resident, the threat of rat lungworm disease is very real and a source of great concern.

The Daniel K. Inouye College of Pharmacy at UH Hilo has been instrumental in bringing rat lungworm disease to the forefront and conducting research with very few resources. It is essential that their research program be fully funded to enable them to carry out the research program defined in the bill. From my standpoint, the research conducted by the College of Pharmacy is key. I want to know the best way to wash vegetables and the most effective products to use. Clinicians need better diagnostic tools to help patients faster. We need to know how to eradicate the disease and protect not just the people of the Big Island, but the people of this state and our visitors.

Thank you for your attention to rat lungworm disease and the its potential catastrophic consequences for this State. I urge you to support this bill and give its funding the highest priority, making sure that the research program is fully funded.

Rat lungworm disease is not a routine issue. The sooner we act, the sooner we will be able to eradicate this threat.

With gratitude for your attention to this issue,
Susan Forbes, DrPH

HB-474-HD-1

Submitted on: 2/26/2018 8:06:12 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Kirsten C.	Individual	Support	No

Comments:

HB-474-HD-1

Submitted on: 2/26/2018 8:44:28 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Emily	Individual	Support	No

Comments:

I strongly support HB474 HD1

I am a resident of Hawaii Island, a Hilo farmer and a parent of two young children. We are trying to teach our children the importance of growing their own food, respecting the 'aina and sharing their bounty with ohana and the community. But how can we with the worry of rat lungworm?

It's affecting our agriculture business as well. People are afraid to eat local produce. Please HELP!

HB-474-HD-1

Submitted on: 2/26/2018 9:06:03 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Susan I Jarvi	Individual	Support	No

Comments:

Testimony Presented Before the Committee on Finance

Tuesday 02-27-18 12:00 pm

HB2506 - Relating to RAT LUNGWORM DISEASE

Chair Luke and Vice Chair Cullen and members of the Committee on Finance,

My name is Dr. Susan Jarvi and I am a Professor in the Department of Pharmaceutical Sciences at the University of Hawaii at Hilo, Daniel K. Inouye College of Pharmacy. My lab has been the lead in rat lungworm education and research for the past 6 years in the state. I am speaking as a concerned individual in strong support of HB 474 Relating to Rat Lungworm Disease (RLWD).

Hawaii is the epicenter for RLWD (angiostrongyliasis) in the United States, and is among the most serious threats to human health of all diseases carried by wildlife in Hawaii. Most infections are presumed to be due to the ingestion of infected slugs or snails on fresh produce or possibly from untreated catchment water (see Howe and Jarvi ,2017; Jarvi et al., 2018 for review). The nematode reproduces in rats and develops in slugs and snails. Although most human cases have originated in east Hawaii Island, there have been cases reported on all of the major Hawaiian Islands, including a recent outbreak on Maui. Why so many cases originate on Hawaii Island is unclear and a better understanding of disease transmission, basic biology, diagnostics, treatment, and long term effects is needed. Thus, funding is requested to address these issues.

My lab recently completed a study to isolate adult RLW from the hearts and lungs of rats to harvest worms to isolate the proteins needed to develop a blood-based diagnostic and also to estimate infection rates in rats trapped in the Hilo area (Jarvi et

al., 2017). Of 545 rats captured, ~94% of them were positive for RLW parasites. This is the highest reported rate in the country and likely the world. Hawaii has likely been exporting RLW with rats jumping on and off ships. During this experiment we observed that older black rats appear to have a mechanism to limit development of larvae to reproducing adults. This was not seen in the young black rats or the Polynesian rats of any age. This means that in the management of rats, killing large numbers of black rats might result in more young black rats moving into that vacated area, which might actually increase transmission. Another option is to determine the effectiveness of deworming rats to reduce transmission. With adequate funding, this could be done in collaboration with USDA-APHIS and others.

Funding is also needed to determine which approved vegetable washes or solutions are most effective at killing larvae so people can better wash their produce, and continue to eat local and fresh produce safely. East Hawaii has the highest use of catchment water in the state. We need to know if the infective stage of the larvae can be detected in catchment water and the best practices for treating catchment water. We have already demonstrated that infective stage RLW larvae can live in rainwater for many weeks. We also would like to test the effectiveness of UV light as used in catchment systems on killing RLW parasites. Lastly, we are testing multiple anti-parasitic drugs on different stages of RLW larvae that develop in humans. All of these studies require an assay to be able to determine that the larvae are truly dead and therefore not infective. We have worked out a differential staining method that appears to distinguish live from dead larvae but we now need to validate this assay in rats. We received \$16,000 in contingency funding from the Hawaii County Council to pay a technician for 2 months and buy supplies and rats to run this trial with USDA-APHIS. Additional funding is requested to then run the other three studies.

We have completed an antibody-based study to estimate exposure to RLW in 435 volunteers most from east Hawaii Island with our Thailand collaborators (Jarvi et al., ms. In prep). We are currently in the process of isolating proteins from Hawaii isolates of RLW to use as antigen in another diagnostic study. Funding is needed to expand this serological study to include multiple areas on Hawaii Island, as well as statewide. We have successfully detected RLW DNA in the blood of infected rats (Jarvi et al., 2015). We request funding to continue to investigate other avenues for diagnosis of angiostrongyliasis.

RLWD impacts the people of Hawaii and its visitors, it impacts public health as a global emerging infectious disease, it impacts agriculture through the loss of public confidence in locally grown produce, and it puts food self-sufficiency and food security (especially

with the Farm to School Bill) for all of Hawaii at risk. RLWD has already caused multiple deaths; many victims suffer long-term disability

Our research group has already built a strong research and educational foundation with which to carry out these studies. Our lab has submitted 30 grant proposals including 12 federal grants but have yet to receive federal funds. Likely the main reason for lack of federal support for rat lungworm research is lack of education about this disease. Many reviewers and agencies have never heard of it and don't consider it seriously. This is a considerable issue to overcome. We are now poised to provide the research and curriculum-based educational efforts needed to truly begin to prevent rat lungworm disease in Hawaii and elsewhere. The state of Hawaii needs to take immediate action. Collaboration between UHH, UHM, DOH, DLNR, DOA and the Task Force is needed to develop a statewide plan for effective control of RLW parasites. Please support HB474 with full, necessary funding.

References:

Jarvi SI, Howe K, Macomber P. Angiostrongyliasis or Rat Lungworm Disease: A Perspective from Hawaii. 2018. Current Tropical Medicine Reports. <https://doi.org/10.1007/s40475-018-0132-z>

Howe K, and Jarvi SI. 2017. Angiostrongyliasis (Rat Lungworm Disease): Viewpoints from Hawaii Island. ACS Chemical Neuroscience. DOI: 10.1021/acscemneuro.7b00299.

Jarvi, SI. Quarta, S, Jacquier S, Howe K, Bcakci D, DaSalla C, Lovesy N, Snook K, McHugh R, Niebuhr C. 2017. High prevalence of *Angiostrongylus cantonensis* (rat lungworm) on eastern Hawaii Island: a closer look at life cycle traits and patterns of infection in wild rats (*Rattus* spp). PLoS ONE 12(12): e0189458. <https://doi.org/10.1371/journal.pone.0189458>

Jarvi, S.I., Pitt WC, Farias MEM, Shiels L, Severino M, Howe K, Jacquier S, Shiels AB, Amano K, Luiz B, Maher D, Allison M, Holtquist Z, Scheibelhut N. 2015. Detection of *Angiostrongylus cantonensis* in the blood and peripheral tissues of wild Hawaiian rats (*Rattus rattus*) by a quantitative PCR (qPCR) assay. PLOS ONE DOI:10.1371/journal.pone.0123064 April 24, 2015.

Jarvi S.I., Farias, M.E.M., Howe, K., Jacquier, S., Hollingsworth, R. & Pitt, W. 2012. Quantitative PCR estimates *Angiostrongylus cantonensis* infection levels in semi-slugs (*Parmarion martensi*). *Molecular and Biochemical Parasitology* 185: 174-176.

HB-474-HD-1

Submitted on: 2/26/2018 11:16:26 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Leokane Harrington Pryor	Individual	Support	No

Comments:

Aloha kakou,

My name is Leokane Harrington Pryor and I live in Hana, Maui. I contracted Rat Lungworm Disease (RLWD) in Hana in February 2017 and was hospitalized in March and again in May 2017. I was given a spinal tap and Maui Memorial- and the CDC confirmed that I had RLWD. I am one of the 7 official Maui cases for 2017. The first time I heard about RLWD was two days before I was hospitalized. A friend sent me an article on the illness outbreak on Hawai'i island. I had never seen any ads, fliers, or warnings in the 16 years I have been living in Hana and on Maui.

A year later, I am still suffering symptoms of the disease including pain in various areas of my body- especially my hands and feet. I am unable to sit for long periods of time and have been unable to work for most of the past year. I have been communicating with many other Maui survivors of the illness this past year including several visitors to Maui who got ill here and were diagnosed on the mainland or in Canada.

I am appealing to the Hawaii legislature to please fund HB474 HD-1 – and approve any other research related funding for RLWD. The residents and visitors to Hawaii need to be protected from this horrible disease. Research is needed to:

Research exactly how the disease is transmitted

Can it be transmitted via water catchment?

Can it be transmitted via snail or slug slime?

Research how to properly clean all produce (not just local grown) to prevent the disease. Is washing with water really effective? Should all produce be cooked or frozen to prevent the spread of the disease?

Research why so many of the Hawaii cases have not fully recovered in “2-8 weeks” as described in the State Department of Health literature. All of the 2017 Maui cases that I know- including myself- are still suffering symptoms a year into the illness. Many of us have been told we may suffer these symptoms the rest of our lives. Is there something about the semi-slug infection – or some other reason – why the Hawaii cases are so severe and on-going?

Research the general population to test if the disease is more widespread with many “minor” cases, undiagnosed cases, etc. How many residents have gotten ill but were not counted as they did not receive a spinal tap?

Research how many visitors have gotten ill in Hawaii and have not been “counted” in Hawaii as they were diagnosed when they returned to their homes. What is the real infection count of this disease?

Mahalo for your consideration of my appeal to you to help prevent this disease and to help the survivors of the disease to improve the quality of their lives.

Leokane Harrington Pryor

Hana, Maui

HB-474-HD-1

Submitted on: 2/26/2018 11:31:55 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Lisa Kaluna	Individual	Support	No

Comments:

Aloha,

My name is Lisa Kaluna, I am the Laboratory Manager for Dr. Susan Jarvi, however my testimony today is my own personal opinion and does not reflect the UHH, RCUH or Dr. Susan Jarvi.

I am writing in support of HB474 for funding to be directed to the UH Hilo Daniel K. Inouye College of Pharmacy Rat Lungworm Research Lab under the direction of Dr. Susan Jarvi. To be clear, my support is solely for the funding to go to this institution and no other research, educational, or health institution.

There are a number of reasons why I believe the state needs to fund Dr. Jarvi's research, a few specific examples include.....

- 1) Dr. Jarvi is the leading RLW researcher nationwide, having 7 publications in peer-reviewed scientific literature since entering the field 6 years ago. With another 3 publications currently in the writing phase.
- 2) Dr. Jarvi's research has a multifaceted approach, addressing the most pressing issues to our community. She has displayed a strong interest and ability to flex the research goals of the lab to address these pressing issues. Dr. Jarvi often adapts to incorporate the best available technology and techniques to her research.
- 3) Given her depth of knowledge and experience in this field, research funding is most effective under her direction. In meetings with potential collaborators, it is clear that many lack some basic and fundamental information about the target parasite, it's hosts, and the effects seen in victims.
- 4) Dr. Jarvi is well connected statewide and especially in our local community, the epicenter of this disease. These connections allow her to stay up to date on the latest developments and to help provide the best science to decision makers.
- 5) Despite Dr. Jarvi's herculean efforts to obtain funding through traditional channels such as federal and local grants, grant applications have been mostly unsuccessful with many reviewer comments indicating they had never heard of this disease and didn't

believe it was as serious as described in the grant application. There is a lack of peer-reviewed articles describing the severity of the disease in Hawai'i and how it's different from past infections or other countries. Only in the last few months have clinicians agreed to start working on the publication of cases studies in Hawaii. This demonstrates a clear need for our state to fund the necessary research to help protect our residents and visitors, at least until the larger funding agencies understand the seriousness of the epidemic we are facing.

6) Dr. Jarvi's leadership spurs dedication and commitment from her staff and students. With serious restrictions on funding, Dr. Jarvi has managed to keep her lab afloat on a shoe string budget in large part because of the dedication of numerous volunteers. Not only do people love volunteering for such an important issue for our community but Dr. Jarvi is also a supportive and caring supervisor. Of course, coordinating and managing so many volunteers takes a team of well trained professionals to keep all of the endeavors on track and on time. This academic year alone, in the lab, we have been lucky to have 2 full time employees (myself included) that train and manage 2 PhD students, 2 Pharm D student volunteers, 4 undergraduate interns, 2 high school student projects, and 3 community member volunteers. Both full time employees volunteered their time over the summer until funding became available for hire in August. Of course funding for both full time employees and lab supplies that support all of these people ends June 2018.

7) RLW research needs to be based in East Hawaii, as there is greater access to the parasite, all hosts, and human victims. In the lab, 20-50 slugs are collected each week, to obtain live larvae to use in our studies. 94% of rats are infected with RLW, providing a source of adult *A. cantonensis* worms which can be used to develop a blood based diagnostic. Access to the greater community and victims allow for studies to research different stages of the disease and factors that might influence exposure or severity of the disease.

Finally, on a personal note, my husband was born and raised in the Puna district. 90% of our family and closest friends live in East Hawaii. EVERYONE we know that lives here, knows someone who contracted a very severe case of RLWD. People are scared and they are taking drastic measures to try and protect themselves and their families. Self diagnosing and subsequent self medicating with drugs from local farm supply stores is more common than you can imagine (no we don't advocate for this, but we regularly hear stories). As Hawaii State Legislatures, if do not personally know a victim of RLWD (a severe case), please take the time to find and talk with someone about their experience and how it has altered their life before you cast your vote on this bill. While there are many mild and moderate cases that do fully recover, the devastation people face who contract a very severe case is horrific. We cannot let our people and our community suffer like this. I would not wish this disease on my worst enemy. Please, do not wait until this disease comes knocking on your doorstep. Please vote in support for funding Rat Lungworm Research at the UH Hilo Daniel K. Inouye College of Pharmacy.

Thank you for your time and consideration,

Lisa M. Kaluna

HB-474-HD-1

Submitted on: 2/26/2018 2:41:32 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
cheryl	Individual	Comments	No

Comments:

In light of what happened this week with the aquaponics people, I believe that the public and officials need more training on this issue. To have someone's business closed down or additional stress on consumers due to the misunderstanding and education on this issue is not ok.

LATE

HB-474-HD-1

Submitted on: 2/26/2018 3:57:48 PM
Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Elena Cabatu	Hilo Medical Center	Support	No

Comments:

Hilo Medical Center fully supports HB474 to appropriate funds to UH Hilo College of Pharmacy to support their efforts in the fight against Rat Lungworm Disease.

HB-474-HD-1

Submitted on: 2/26/2018 8:54:23 PM

Testimony for FIN on 2/27/2018 12:00:00 PM

LATE

Submitted By	Organization	Testifier Position	Present at Hearing
Rosemarie Patronette	Individual	Support	No

Comments:

LATE

HB-474-HD-1

Submitted on: 2/27/2018 9:04:15 AM

Testimony for FIN on 2/27/2018 12:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Jeanne Kapela	Individual	Support	No

Comments:

Aloha Chair Luke and members of the committee,

The outbreak of rat lungworm disease that has spread throughout the islands must be brought under control. While the Hawai'i Department of Health calls rat lungworm a rare illness, it is difficult to discern exactly how many people get infected each year. Symptoms can range from very mild—headaches, stiffness of the neck, nausea—to severe, even resulting in temporary paralysis or comas, and usually start one to three weeks after exposure and can last from two weeks to months.

The Big Island of Hawai'i has become ground zero for the outbreak. UH-Hilo College of Pharmacy professor Dr. Susan Jarvi, who's lab is home to the Hawaii Island Rat Lungworm Working Group, maintains a compendium of research that still needs to be done to better understand the disease, especially since Hawai'i County has seen more cases of the illness than any other part of the islands.

As a resident of the Kona community, I implore you to provide more funding for research into this illness, services for those who have been affected, awareness to prevent its further spread, and medical treatments to eradicate its existence from our shores.

Mahalo,

Jeanne Kapela