

SB 3124

**TESTIMONY OF
Kenneth Y. Kaneshiro**

IN OPPOSITION OF SB 3124 RELATING TO THE STATE MICROBE

**BEFORE THE
COMMITTEE ON TECHNOLOGY AND THE ARTS
Senator Glenn Wakai, Chair
Senator Clarence K. Nishihara, Vice Chair**

DATE: Tuesday, February 25, 2014
TIME: 1:15 pm
PLACE: Conference Room 414

Aloha Chair Wakai, Vice Chair Nishihara and Members of the Committee on Technology and the Arts. My name is Ken Kaneshiro and I am the Director of the Center for Conservation Research & Training at the University of Hawai'i at Manoa. However, I am presenting testimony on SB 3124 as a private individual and my comments do not reflect the opinion of the University of Hawai'i.

While I support the intent of the bill to designate a State Microbe, I **strongly oppose** the proposed designation of a species such as *Vibrio fischeri* which is not native to the Hawaiian Islands. *V. fischeri* is a cosmopolitan species and is found elsewhere in the world; as such, *V. fischeri* is an alien species to the Hawaiian Islands and passage of SB 3124 would send a message to the general public that a non-endemic, alien species is appropriate for designation as a State Symbol. As stated in SB 3124, "...designated symbols are representative of all things unique to Hawaii and its individual islands." *V. fischeri* is clearly not in compliance with the language of the Bill.

I have been involved in a research project at the University of Hawai'i for nearly 50 years now. I started working on the Hawaiian Drosophila Project when I was a sophomore at UH Manoa in 1963 and so 2013 marked the 50th Anniversary of the Project. During these 50 years, more than 80 senior scientists from all over the world have come to Hawaii to study the evolution of this group of insects. More than 400 students, undergraduates, graduates, and postdoctoral fellows have participated on this project and more than 500 scientific papers have been published as a result of the research on this group. The work on the Hawaiian Drosophila is cited in a number of textbooks of Biology as one of the leading examples of speciation and evolution.

About 10 years ago, one of the scientists (now deceased) from New York University and his students, discovered a huge fauna of bacteria species associated with the Hawaiian Drosophila species. They were able to isolate and culture nearly 600 colonies of bacteria from just 40 of the potentially 1000 species of Hawaiian Drosophila. It turns out that many of the bacteria species showed strong resistance to antibiotics. That meant that the

bacteria were being exposed to antibiotic substances produced by the host fly and potentially, if we are able to understand the immunogenetic mechanism by which the bacterial pathogen is triggering a gene or a group of genes that were responsible for the production of a protein or enzyme which serves as an antibiotic against the pathogenic effects of the bacteria, we may be able to develop a similar mechanism to turn on genes for neutralizing the effects of pathogens in humans. The potential application to medicine and human health is huge.

During the summer of 2011, Ms. Iris Kuo, then a high school student from Iolani School did a 6-week internship with our research program and worked with Dr. Stuart Donachie because of her interest in the microorganisms associated with the host plants of our Hawaiian *Drosophila* species. During her research, Iris discovered what turned out to be a new species of bacteria which she named and described as *Flavobacterium akiainvivens*. It has been given the Hawaiian name, *Ko'ohuna 'ili akia*, which literally means 'bacteria living on the bark of the akia'. While Iris was only a high school student, she experienced the excitement of scientific discovery and she has already published a paper describing her discoveries in a prestigious scientific journal, the *International Journal of Systematic and Evolutionary Microbiology*.

The biological diversity of microorganisms (potentially thousands of species) that could be found in the native Hawaiian ecosystem is a gold mine waiting to be discovered and it will be important to encourage more research effort on this fauna. Designation of a State Microbe will bring greater attention to this fauna and foster the kind of research and education that is needed to uncover the potential value of the microbial fauna found in our native ecosystems. However, it is imperative that designation of a state symbol be reserved for species that are native and unique to Hawai'i rather than designating an alien species as the State Microbe.

For these reasons, I oppose the intent of SB 3124.

Thank you for the opportunity to provide testimony.

Hawaii is home to many wonderful microorganisms and, to this microbiologist, any one of them would be a beautiful diplomat for the Aloha State. While the bacterium *Vibrio fischeri* is a species found in many places around the Earth's oceans, it is best known for its symbiosis with the Hawaiian bobtail squid. As a microorganism living in a mutually beneficial association with its host, it is a symbol of harmony, and the gift it gives to the squid is its bioluminescence, which helps keep the host safe from harm. The attractiveness of this relationship continues to provide an important and timely lesson to students of all ages.

I do not envy the task of the Hawaii legislature in deciding among the many worthy microorganisms that call the Aloha State their home. In any case, I commend you on soon becoming among the first of the States to formally recognizing the importance of the microbial world in our lives.

Dr. Edward Ruby

Having a state microbe is a great opportunity to promote both the field of microbiology and the diversity of Hawai'i's organisms. Hawaii has been isolated in the middle of the Pacific Ocean for thousands of years allowing for speciation to occur from dispersal and colonization between islands. Famous endemic organisms that arose from speciation within the Hawaiian Islands include the Hawaiian honeycreepers, Hawaiian silverswords, and Hawaiian *Drosophila* flies. These plants and animals branched off from their mainland counterparts and evolved in isolation until they became a different species unique to Hawaii.

Flavobacterium Akiainvivens (HB293 HD1) and *Vibrio Fischeri* (Senate Bill 3124) both do amazing jobs of encouraging people to pursue careers in the science field, but only the former takes the diversity of Hawai'i's organisms into account. On the one hand, the microbe *Vibrio Fischeri* has a symbiotic relationship with the Hawaiian Bobtail Squid; however, *Vibrio Fischeri* itself is not endemic to Hawai'i and is found in nearly all of the earth's oceans. The only local ties that *Vibrio Fischeri* has is its endemic squid host and is thus not a microbe that is unique in origin to Hawai'i. On the other hand, *Flavobacterium Akiainvivens* was found on a rotted shrub by 'Iolani School alumna and current University of Washington at Saint Louis undergraduate Iris Kuo. Much like *Vibrio Fischeri*, the *Flavobacterium Akiainvivens* flourishes on an endemic Hawaiian host, the flowering shrub Wikstroemia ('akia'). *Flavobacterium Akiainvivens* may also attract the endemic *Drosophila craddockae* to 'akia, whereupon the *Drosophila* lays its eggs; this species of *Drosophila*, one of the previously mentioned organisms that arose throughout the course of speciation events for thousands of years, will not lay eggs anywhere else. The key difference here is that *Flavobacterium Akiainvivens* has not been detected elsewhere in the world and is unique in origin to Hawai'i (unless proven otherwise).

Both *Flavobacterium Akiainvivens* and *Vibrio Fischeri* are great microbes to promote microbiology and the diversity of organisms in Hawai'i but *Vibrio Fischeri* falls short in the requirement that it is not unique in origin to Hawai'i. The symbiotic host of *Vibrio Fischeri* is the endemic Hawaiian Bobtail Squid, and this squid can perhaps become the state squid (if there isn't one already), but the title of state microbe does not belong to a microbe that can be found in nearly all oceans of the world. Instead, we should save the title of state microbe for an organism like *Flavobacterium Akiainvivens*, or some other microbe, that is unique in origin to Hawai'i and not found elsewhere in the world.

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Sunday, February 23, 2014 10:58 AM
To: TECTestimony
Cc: palmpalms@aol.com
Subject: *Submitted testimony for SB3124 on Feb 25, 2014 13:15PM*

SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
bob davis	paniolo palms	Oppose	No

Comments:

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SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Brandon Yoza	Individual	Oppose	No

Comments: *Vibrio fischeri* is not endemic or native to Hawaii.... The key point being endemic and native. While the bobtail squid is a special creature found in our waters, its symbiotic resident is not. The bill should focus on the significance of the microorganism and not its host. As *Vibrio fischeri* is fairly ubiquitous in the marine environment it does nothing to promote the uniqueness of our Hawaiian environment.

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SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Thomas Ranker	Individual	Oppose	No

Comments: Honorable Senators, *Vibrio fischeri* is not an appropriate choice for a State Microbe because it is not endemic to Hawaii and is, in fact, globally distributed. A much better choice is the ko'ohuna 'ili akia (*Flavobacterium akiainvivens*) which has been proposed as the State Microbe in Bill HB293. Ko'ohuna 'ili akia is unique to Hawai'i, it was discovered and named by someone with Hawaiian roots, and has a name that reflects its Hawaiian origin. Mahalo for considering my comments.

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Gordon Fernandez

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Cc: iriskuo8@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Iris Kuo	Individual	Oppose	No

Comments: I oppose SB3124 because the microbe in question, *Vibrio fischeri*, is neither endemic nor native to Hawaii. In fact, it is found in nearly all the oceans of the world. It was not discovered in Hawaii, and the person who discovered it does not have a connection to Hawaii. If the aim is to encourage science in Hawaii, the microbe should be unique to Hawaii and have ties to Hawaii in order to make it more accessible and inspiring to students in Hawaii. *Ko`ohuna `ili akia* (*Flavobacterium akiainvivens*), described in HB293, is both native and endemic to Hawaii, was discovered in Hawaii by a student born and raised in Hawaii, has a Hawaiian name, and includes Hawaiian in its scientific name. I oppose SB3124 for *Vibrio fischeri* and ask that HB293 for *Ko`ohuna `ili akia* be considered instead.

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Gordon Fernandez

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To: TECTestimony
Cc: hedgesew@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Jerris Hedges, MD	Individual	Oppose	No

Comments: Aloha, Although I support the concept of a state microbe to advance science in our state, I must speak against SB 3124. There are specific criteria that a State microbe should meet for acceptance by legislative decree. Specifically, the microbe should be endemic to Hawaii, discovered here, and discovered by someone with significant Hawaiian roots. Unfortunately, (Ho'okuna 'ili akia), or *V. fischeri* is not endemic to Hawaii, nor was it discovered here, nor was it discovered by anyone with significant Hawaiian roots. In distinction, last year's candidate microbe, in HB293, met all the criteria set by the previous House Committee. That microbe is Ho'okuna 'ili akia or *Flavobacterium akiainvivens*. *V. fischeri* is a globally distributed marine microbe. Although, Bill SB 3124 emphasizes the microbe's association with the Hawaiian Bobtail squid, the Bill makes a better case for a 'State Squid' than a state microbe. Since *V. fischeri*, does not satisfy any of the criteria one would expect of a State Microbe, I must OPPOSE Bill SB3124. I ask that the hearing Committee instead consider re activating Bill HB 293 for Ho'okuna 'ili akia, (*Flavobacterium akiainvivens*). It's important that Hawaii has the most appropriate and relevant State Microbe. Jerris R. Hedges, MD Dean, John A. Burns School of Medicine

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SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Marek Kirs	Individual	Oppose	No

Comments: V. fischeri does NOT satisfy any of the criteria one should demand of a State Emblem: 1. V. fischeri is not endemic to Hawaii, 2. it was not discovered here, 3. it was not discovered by anyone with significant Hawaiian roots.

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SB3124

Submitted on: 2/23/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Ashlynn Aoki	Individual	Oppose	No

Comments: I would like to oppose Bill SB3124, which proposes *Vibrio fischeri* as a new candidate for Hawaii's State Microbe. My reasoning is that the state microbe should have ties to Hawaii in order to represent our state well. To my knowledge, this microbe did not originate in Hawaii and was not discovered by individuals from the state. However, I would like to propose that the microbe *Flavobacterium akiainvivens* (Ho'okuna `ili akia) be considered instead because it has a Hawaiian component in its name and was also discovered by two researchers in Hawaii. Thank you for your consideration.

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To: TECTestimony
Cc: akinyikwasa@gmail.com
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SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Jasmine	Individual	Oppose	No

Comments: I am firmly in favor of HB293, Ko'ohuna 'ili akia (Flavobacterium akiainvovens) being the state microbe instead.

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To: TECTestimony
Cc: anirudh.krishna2015@gmail.com
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SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Raja Krishna	Individual	Oppose	No

Comments: The microbe in question is not endemic to Hawaii, and is therefore not special enough to be the state's official microbe. I support declaring *Flavobacterium akiainvives* (Ho'okuna `ili akia) as the state microbe. It was discovered in Hawaii, by Hawaiians!

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Sent: Saturday, February 22, 2014 7:28 PM
To: TECTestimony
Cc: courtney.m.yang@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Courtney Yang	Individual	Oppose	No

Comments: Those reasons include that *Vibrio fischeri* is not endemic or native to Hawaii, it was not discovered in Hawaii, it was not discovered by anyone with Hawaiian roots or connections, nor does it have any Hawaiian 'element' or 'flavor' in its name.

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Cc: nahuelfefer@wustl.edu
Subject: *Submitted testimony for SB3124 on Feb 25, 2014 13:15PM*

SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Nahuel Fefer	Individual	Oppose	No

Comments:

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To: TECTestimony
Cc: studentguineveredavenport@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM
Attachments: OPPOSEBILL.doc

SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Guinevere Davenport	Individual	Oppose	No

Comments:

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Sent: Saturday, February 22, 2014 2:16 PM
To: TECTestimony
Cc: susanmfd@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM
Attachments: Aloha Honorable Members of our legislature.docx

SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Susan MF Davis	Individual	Oppose	No

Comments:

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Cc: mlieberman1@hawaiiantel.net
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Michael Lieberman	Individual	Oppose	No

Comments: The bacterium proposed in this bill as the official State Microbe, *Vibrio fischeri*, has no particular connection to Hawaii. This organism has been studied at many different locations, including Scripps Institute of Oceanography, CA, Marine Biological Lab at Woods Hole, MA, and the Univ. of Chicago, by many different scientists, not connected to Hawaii. The fact that it is also associated with the Hawaiian bobtail squid does not make it "Hawaiian". The official State Microbe should be an organism that is directly associated with Hawaii by being endemic (native) to Hawaii and discovered and studied by scientists with a direct connection to Hawaii and local scientific or academic institutions. The organism proposed in this bill does not satisfy these criteria.

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Sent: Saturday, February 22, 2014 4:52 AM
To: TECTestimony
Cc: masanobu_komizo@jcom.home.ne.jp
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Masanobu Komizo	Individual	Oppose	No

Comments: I don't think vibrio fischeri is a good choice. It is not Hawaiian.

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Cc: akemi.komizo@jcom.home.ne.jp
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SB3124

Submitted on: 2/22/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Akemi Komizo	Individual	Oppose	No

Comments: My idea of a state microbe is one which was found first in Hawaii and perhaps exists only in Hawaii. *Vibrio fischeri* is not that microbe. I believe there is another candidate which was discovered in Hawaii by a local school girl. That would be a perfect choice. I oppose SB3124.

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To: Hawaii State Legislature
Re: Testimony on Bill SB 3124

February 20, 2014

Dear Hawai'i State Legislature,

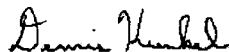
I am writing to oppose Bill SB 3124 which would designate *Vibrio fischeri* as the Hawai'i State Microbe. I am a scientist and science stock photographer in Hawai'i and have photographed this bacterium, as well as another bacterium (*Flavobacterium akiainvivens*) that has been proposed for the State Microbe (Bill HB 293 HD1, introduced in 2013).

My opposition to SB 3124 is that *Vibrio fischeri* is NOT endemic to Hawai'i. It is a ubiquitous bacterium that occurs in many ocean environments. My understanding of the criterion for state symbols is that they must represent "things" that are unique to Hawai'i. *Vibrio fischeri* is NOT unique and endemic to the state. Thus I oppose Bill SB 3124.

In addition, I would strongly suggest that you consider Bill HB 293 HD1 that was introduced in early 2013. *Flavobacterium akiainvivens* is well suited to be the State Microbe because the species was discovered (and named) in Hawai'i after being found on the *Wikstroemia* shrub (Ko'ohina 'ili akia). In addition, it was discovered by an Iolani high school student working on a Science Fair project. Thus, it fits the criterion for being 'unique' and 'endemic' in the state of Hawai'i.

I hope you will consider Bill SB 3124 carefully before moving forward.

Sincerely,



Dennis Kunkel PhD

February 20, 2014

Re: SB 3124, Relating to the designation of *Vibrio fischeri* as the state microbe

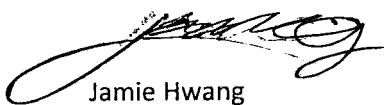
To: Members of the Senate Committee considering SB3124

My name is Jamie Hwang and I am a senior at Moanalua High School. I am writing this letter to express my support for SB3124. I would like to voice my opinion from a student's point of view upon this bill. I believe designating a state microbe is an excellent opportunity to expose us [students] as well as the general public to the vast amount of unknown organisms living in Hawaii. And I believe designating the *Vibrio fischeri* as the state microbe is the perfect start to do so.

From a student's perspective, my research upon the *Vibrio fischeri* was very enlightening and intriguing. It was something that I was genuinely interested in learning about. This confirmed my belief that this microbe is extremely fitting to be designated as our official state microbe. I believe that when the official symbols of the state of Hawaii are taught to students, this microbe will be one of the most interesting, especially to the younger students (elementary/middle school). Designating such a fascinating organism such as the *Vibrio fischeri*, I believe, will serve as a very appealing aspect in regards to the lesson of our state's symbols. However, not only do I believe that this designation can be effectively used for education lessons, but also can potentially be a spark for further interest upon these related science fields (marine biology, microbiology etc.).

I strongly support the designation of the *Vibrio fischeri* as the official state of Hawaii's microbe not only because of its intriguing characteristics but also because of the potential it has to serve as a tool to encourage further interest in science/related studies within schools and students. Thank you for the opportunity to provide my testimony upon SB3124.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jamie Hwang', written in a cursive style.

Jamie Hwang

February 21, 2014

Re: Senate Bill 3124 in regards to designating *vibrio fischeri* as the official microbe of the State.

I am writing this letter in support of the passage of SB3124. My name is Nicole Heafner, and I am a senior at St. Andrew's Priory School. I believe that adapting a state microbe will help to increase an interest in science in the State. The symbols of the State are known to students and often backgrounds on the symbols are provided in school. Designating a State microbe would encourage classroom discussions in science while boosting State pride.

The word "bacteria" tends to have a negative connotation. There are many good bacteria, and even bacteria that live inside of our bodies that help us to function on a normal basis. Most people don't think about the good bacteria, or how they are able to help us. The focus is on the bad bacteria and how they cause harm. The *vibrio fischeri* has a symbiotic relationship with the Hawaiian bobtail squid, just as we have a symbiotic relationship with the bacteria in our bodies. In fact, studying the symbiotic relationship between the squid and *vibrio fischeri*, and how they communicate with each other can give researchers more insight into how our bodies communicate and work with the many bacteria that live inside us. Designating *vibrio fischeri* as the State microbe could help to get more people interested in science and help us to learn more about bacteria and symbiotic relationships, how they work, and how they affect us.

Sincerely,

Nicole Heafner

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 9:28 AM
To: TECTestimony
Cc: gcheng@wustl.edu
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

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Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Geoffrey Cheng	Individual	Oppose	No

Comments: *Vibrio fischeri* is not endemic or native to Hawaii, it was not discovered in Hawaii, it was not discovered by anyone with Hawaiian roots or connections, nor does it have any Hawaiian 'element' or 'flavor' in its name. I believe a microbe of 'local' origin will be the best State Microbe; telling Hawaii's kids that their State Microbe was also discovered by a fellow school kid would be a great way to inspire them. HB293 for Ko'ohuna 'ili akia (*Flavobacterium akiainvivens*) should be considered instead. Thank you.

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Testimony of
Kathleen Corpuz
Farrington High School

In Support of SB 3124 Relating to the State Microbe
Committee on Technology and the Arts
Conference Room 414
February 25, 2014

Aloha Committee Members,

I am Kathleen Corpuz, the Associated Student Body President of Farrington High School and the President of the Oahu 4-H. I am writing to you to support the installation of our state microbe, *Vibrio fishceri*.

This microbe plays a crucial role in the survival of the Hawaiian bobtail squid in which it helps the squid illuminate in the moonlight in order to blend into its surroundings for survival. The Hawaiian bobtail squid are endemic to Hawaii and a source of food for Hawaiian Monk seals; therefore, it has a vital role in our ecosystem. In addition, Oregon has yeast as its state microbe while Wisconsin's *Lactococcus lactis* helps in the fermentation of cheese. Each microbe is responsible for continuing the production of a valued item from each state. For this reason, *Vibrio fishceri* also help Hawaii to maintain the lives of the Hawaiian bobtail squid and Hawaiian Monk Seals.

Having *Vibrio fishceri* as the state microbe would captivate the interest of children to join the Science, Technology, Engineering and Math (STEM) programs as they will have the opportunity to observe the Hawaiian bobtail squid's ability to illuminate with the help of the microbe. I have worked with numerous children through 4-H and am sure that they will be more interested watching this microbe play into action to help the Hawaiian bobtail squid survive, for it is something that they can see for themselves.

Thank you for your time and consideration.

Sincerely,

Kathleen Corpuz

Testimony of
Amy Peria
Wallace Rider Farrington High School

In Support of SB3124 Relating to the State Microbe
Committee on Technology and the Arts
Conference 414
February 23, 2014

Aloha Members of the Committee:

I am Amy Peria, a senior of Farrington High School, Vice President of the Farrington Family, Career, and Community Leaders of America (FCCLA) Chapter, and Secretary of the Oahu County 4-H. I highly support *Vibrio fishcheri* as the designated Hawai'i State Microbe. However, my opinion does not reflect the opinion of Farrington High School, Farrington FCCLA Chapter, and the Oahu County 4-H.

A colony of *Vibrio fishcheri* is bacteria that live within the Hawaiian Bobtail Squid's mantle. Often bacteria are perceived to be dangerous among organisms, but *V. fishcheri* plays a vital role for the squid native to our islands as it camouflages itself from predators and preys. The squid uses the bacteria to adjust itself with the current light intensity it is in to hide itself. The bacteria glow because it produces autoinducer, a chemical signal that glows – the more bacteria within an enclosed area, the brighter the light is going to be. The survival of the Bobtail Squid is very important because it is a source of food for the Hawaiian Monk Seals.

As a student of Farrington's Advanced Placement (AP) Biology, we have learned about different biological factors that affect our environment and evolution. It would have been very interesting to learn about the evolution of *Vibrio Fischeri*. Also, children are most interested in things that catch their attention such as a glowing squid. If the lesson was within their interest, teachers would not have a difficult time teaching and it will quickly capture their attention. It will also strengthen their interest in science that may trigger their aspirations within the Science, Technology, Engineering, and Mathematics (STEM) fields.

Sincerely,
Amy Peria

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 10:06 AM
To: TECTestimony
Cc: tai.throwaway@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM
Attachments: state_microbe.docx

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Tai Tomozawa	Individual	Oppose	No

Comments:

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To: TECTestimony
Cc: ian.m.lever@wustl.edu
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Ian Lever	Individual	Oppose	No

Comments: We believe *Vibrio fischeri* is NOT a suitable candidate because *Vibrio fischeri* is not endemic or native to Hawaii (it is found in nearly all the oceans of the world), it was not discovered in Hawaii, it was not discovered by anyone with Hawaiian roots or connections, nor does it have any Hawaiian 'element' or 'flavor' in its name.

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Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 10:32 AM
To: TECTestimony
Cc: lila.rubin@wustl.edu
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
lila rubin	Individual	Oppose	No

Comments: *Vibrio fischeri* is not endemic or native to Hawaii and was not discovered in Hawaii. It was not discovered by anyone with Hawaiian roots or connections, nor does it have any Hawaiian element in its name. I would suggest that you consider HB293 for Ko'ohuna 'ili akia (*Flavobacterium akiainvivens*) instead.

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From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 10:32 AM
To: TECTestimony
Cc: mbeetstra@wustl.edu
Subject: *Submitted testimony for SB3124 on Feb 25, 2014 13:15PM*

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Maggie Beetstra	Individual	Oppose	No

Comments:

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Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 10:38 AM
To: TECTestimony
Cc: kskjoldager@yahoo.com
Subject: *Submitted testimony for SB3124 on Feb 25, 2014 13:15PM*

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Kara Skjoldager	Individual	Oppose	No

Comments:

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Emily Kubo

I strongly oppose Bill SB3124 because *Vibrio fischeri* is not a suitable candidate for the following reasons. *Vibrio fischeri* is not endemic or native to Hawai'i, was not discovered in Hawai'i, was not discovered by anyone with Hawaiian roots or connections, nor does it have any Hawaiian 'element' or 'flavor' in its name.

I say that Bill HB293 be considered instead because it meets all the criteria stated above that *Vibrio fischeri* does not. Hawaii has always been known for and prides itself in its love and appreciation of community and `ohana. It only seems fitting that anything that represents the Aloha State showcases the local community and the people nurtured in it.

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 11:34 AM
To: TECTestimony
Cc: claudiavaughan@wustl.edu
Subject: *Submitted testimony for SB3124 on Feb 25, 2014 13:15PM*

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Claudia Vaughan	Individual	Oppose	No

Comments:

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Ashlyn Koga

When I look at a list of Hawai'i state symbols [http://en.wikipedia.org/wiki/List_of_Hawaii_state_symbols], I see animals and plants that have strong ties to our islands. For example, the nēnē is endemic to Hawai'i and the word humuhumunukunukuāpua'a was incorporated into my vocabulary by kindergarten. Although I do not expect our keiki to fully understand what a microbe is, I believe that our state microbe should be easily identifiable with our islands. It is for this reason that I oppose measure SB3124.

I recently learned about *Aliivibrio fischeri* in my college microbiology class, and my professor did mention that the bacterium was discovered using the Hawaiian bobtail squid. I can see an appeal in making it our state microbe because it is the go-to bacterium to explain a mechanism known as quorum sensing. However, the tie to our islands is weak. *Aliivibrio fischeri* does not have a Hawaiian name, was not discovered by someone from Hawai'i and aside from the squid, does not have a unique connection to our state.

If the committee limits this to ONE state microbe, I suggest measure HB293 for Ko'ohuna 'ili akia (*Flavobacterium akiainvivens*). The name itself means, "bacteria from akia bark," a plant which is endemic to Hawai'i. In addition, if I was told in high school that our state microbe was discovered by a Hawai'i high school student, the scientific world would seem less daunting to me.

I oppose measure SB3124 because *Aliivibrio fischeri* cannot meet the criteria of a state symbol for Hawai'i because its ties to our islands are weak and distant. Nothing about it screams Hawai'i, and on its face, it does not appear to be remotely related to our state.

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 12:28 PM
To: TECTestimony
Cc: mastevenson95@yahoo.com
Subject: *Submitted testimony for SB3124 on Feb 25, 2014 13:15PM*

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Megan Stevenson	Individual	Oppose	No

Comments:

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Testimony OPPOSING Bill SB3124, from Dr. Stuart Donachie (2/24/14)

I am a Professor of Microbiology at the University of Hawaii at Manoa. I have been a microbiologist for almost 30 years.

I OPPOSE Bill SB3124 to designate *Vibrio fischeri* as the State Microbe for Hawaii. This microbe does not have the connections to Hawaii that one would expect of a State emblem. More worthy candidates for the State Microbe exist.

The effort to establish a State Microbe in Hawaii began early in 2010, with a candidate microbe's name (*Nesiotobacter exalbescens*) published in Science, Volume 328, 30 April, 2010. HB 2079 proposed this microbe as State Microbe in 2012. This microbe was discovered on Laysan in the Northwestern Hawaiian Islands. The committee that heard HB2079 made suggestions that were subsequently used as criteria by microbiologists and students to search for a different microbe; the committee wanted a microbe discovered in Hawaii, but they also asked that the microbe have a Hawaiian name. Internationally established rules for naming microbes require the use of Latin, although non-Latin words can be modified and used.

Shortly after the hearing, a Hawaii-born high school student discovered and named *Flavobacterium akiainvivens*; this species was then proposed as the State Microbe in 2013, in HB293. The microbe's name includes 'akia', the shrub upon which the microbe was discovered, so a Hawaiian word was used in the formal Latin name. The microbe also has a Hawaiian name, Ko'ohuna 'ili akia. Strengthening the Hawaiian connections, the 'akia upon which the microbe was discovered also hosts the endemic *Drosophila craddockae*, which lays its eggs only on this 'akia species. Ko'ohuna 'ili akia belongs to Hawaii, and this is clear in its name, its associations with two other endemic Hawaiian species ('akia, *Drosophila craddockae*), and the fact it was discovered by someone born, raised and educated in Hawaii.

If we consider *Vibrio fischeri*, the microbe nominated in SB3124, this species was first discovered in a water sample collected from the North Sea (between England and the European continent) in 1860, by a Dutch microbiologist. It was named after a German microbiologist, Fischer. It has long been known to microbiologists as a microbe found in seawater around the world; it also forms an association with marine animals, one of which is the Hawaiian Bobtail squid, and it is this association that is essentially the microbe's only connection to Hawaii.

Beyond microbes, Hawaii's State emblems should have strong connections to the State, as described above. This is clear when one examines current emblems. These connections have also been established in the case of a candidate for State Microbe, as specifically requested by legislators. However, *Vibrio fischeri* lacks these strong connections. Specifically, it was not discovered in Hawaii, nor was it discovered by anyone with significant Hawaiian connections, such as birthplace. It also lacks any Hawaiian elements in its name. In view of such factors, I urge the Senate Committee on the Technology and the Arts not to pass Bill SB3124 for further action. The committee should rather consider Bill HB293.

Stuart Donachie

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 2:32 PM
To: TECTestimony
Cc: delfigrinspan@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Delfina Grinspan	Individual	Oppose	No

Comments: I think HB293 for Flavobacterium akiainvivens is much more appropriate as that bacterium is actually native to Hawaii (unlike that specified by SB3124).

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Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 3:53 PM
To: TECTestimony
Cc: mowenmartin@gmail.com
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM
Attachments: StateMicrobe(MM).pdf

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Mark Martin	Individual	Support	No

Comments:

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Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 4:15 PM
To: TECTestimony
Cc: spencer.nyholm@uconn.edu
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM
Attachments: Nyholm_HI_Senate_Letter.pdf

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Spencer V. Nyholm, Ph.D.	Individual	Support	No

Comments:

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Date: February 24, 2014

To: Members of the Senate Committee considering SB3124

From: Jannah Lyn Dela Cruz
Moanalua High School, 12th grade
Honolulu, HI 96818

Re: SB3124, Establishing and designates *Vibrio fischeri* as the official microbe of the State

Aloha! My name is Jannah Lyn Dela Cruz, and I am a senior at Moanalua High School. Since my freshmen year, I have been active in the STEM side of my school. I participate as an active director of Moanalua High School Robotics, and having been taking a math and science course since my freshmen year. Through robotics, I had experienced the opportunity to inspire and share my passion for STEM not only with students, but with residents and even tourists of Hawaii through robotics at events such as Honolulu Festival, YMCA Healthy Kids Day, and robotics competitions.

I believe that STEM, more so STEAM (Science, Technology, Engineering, Art and Technology), plays a crucial role in the lives of current and incoming generations today. At a glance, this world is exponentially advancing in technology and research, that a smartphone has been evolved from the basic flip phone just within a decade. Because technology and research is advancing, people—especially students—should not only be exposed to the helping and healing benefits of STEAM, but as well as intriguing discoveries even though it may or may not help world hunger or homelessness.

By establishing and designating the *Vibrio fischeri* as the official microbe of the State, we would be exposing this microbe to the entire state and the nation, allowing the people of Hawaii to embrace the little-big things that Hawaii offers the world. This microbe, which lives in a symbiotic relationship with the Hawaiian Bobtail Squid found on our reefs, may inspire students of Hawaii to take interest in STEAM, and potentially go into careers of the STEAM field. One of the best ways to expose the *Vibrio fischeri* to at least our students is establishing it as our State microbe.

Again, with the world advancing, I believe that we need to help carry our students and the rest of the people of Hawaii to bring us on track with technology and research advancements so we are not left behind. One day, of the students that may take interest in the STEM field because of the state microbe, the *Vibrio fischeri* may be put into a successful experiment that may benefit our state and the world. Such possible benefits from this microbe or even other discoveries that our future generations may make could bring Hawaii ahead of the world.

In addition to all of this, because this microbe enables the Hawaiian Bobtail Squid to produce bioluminescence, visually similar to glow-in-the-dark items keiki like to play with, or even the neon lights that kids, teens and adults like to see in laser tag rooms, cars, and some celebration settings, this microbe shows the world that biology is not boring, but can be rather appealing. This microbe is a working art of science: it helps the Hawaiian Bobtail squid survive while showing off its light.

In my belief, the establishment and designation of the *Vibrio fischeri* as our state microbe may inspire and captivate young generations to take part in the STEAM field and soon take part in improving the state of Hawaii through STEAM projects.

If you have any questions or concerns, please contact me through my email: jannahlynd131@gmail.com. Thank you very much for your consideration and for taking the time to read this.

Sincerely,

Jannah Lyn Dela Cruz

Gordon Fernandez

From: mailinglist@capitol.hawaii.gov
Sent: Monday, February 24, 2014 10:14 PM
To: TECTestimony
Cc: tongh@hawaii.edu
Subject: Submitted testimony for SB3124 on Feb 25, 2014 13:15PM

SB3124

Submitted on: 2/24/2014

Testimony for TEC on Feb 25, 2014 13:15PM in Conference Room 414

Submitted By	Organization	Testifier Position	Present at Hearing
Tung Hoang	Individual	Oppose	No

Comments: I'm a Professor of Microbiology at UH Manoa. *Vibrio fischeri* isn't unique to Hawaii and is found throughout the globe and was not describe first by scientists in Hawaii. I would support having a microbe that is uniquely endemic, or was first found in Hawaii. Therefore, I can't support a cosmopolitan marine microbe such as *Vibrio fischeri*. Something that is first described in Hawaii and uniquely belongs to the State of Hawaii represents our pride. Nothing to be proud of the a ubiquitous microbe like *Vibrio fischeri*. I oppose SB3124

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Karen Dang

From: Barb Cuttance <events@foodnsport.com>
Sent: Monday, February 24, 2014 4:46 PM
To: TECTestimony
Subject: SB3124 & SB3107

Chairman Waikai and committee members

Thank you for the opportunity to testify on this bill and indeed for the opportunity to testify using video conferencing. For the people of Hawaii Island and the other neighbor islands this is an important step and use of technology.

I strongly support SB3124 and ask that this bill be passed.

Vibrio fischeri is an important microbe to Hawaii and it its important that we recognize this unique microbe as being distinctly our microbe.

Please pass this important bill

Barbara Cuttance

14/266 Papaya Farms Road, Pahoia, Hawaii 96778