

Through the one health concept, How could Human be in harmony with marine parasites

Group PITO

Team leader: Zou Yuntong

Team members: Zou Zongyou;
Wang Shengke; Jiang Huixin;
Zhu Linglu; Jiang Ying; Du Jiani



Zou Yuntong
From veterinary medicine



Zou Zongyou
From animal science



Du Jiani
From enviromental
science



Jiang Huixin
From animal pharmacy



Wang Shengke
From veterinary medicine



Jiang Ying
From veterinary medicine



Zhu Linglu
From business administration

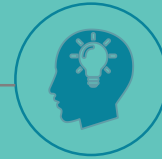
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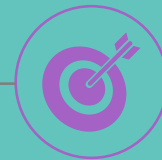
Project Overview



Offline Promotion



International Workshop



**Subsequent Seminar For
The Whole University**



Online Series Promotion



The Further Promotion

The outbreak of Anisakis is still a **huge challenge** we never ever faced before.

EurekAlert! | AAAS

HOME COVID-19 NEWS RELEASES MULTIMEDIA MEETINGS PORTALS

NEWS RELEASE 19-MAR-2020

'Sushi parasites' have increased 283-fold in past 40 years

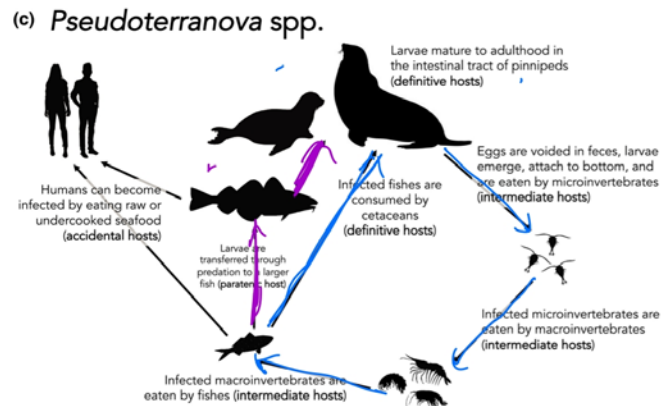
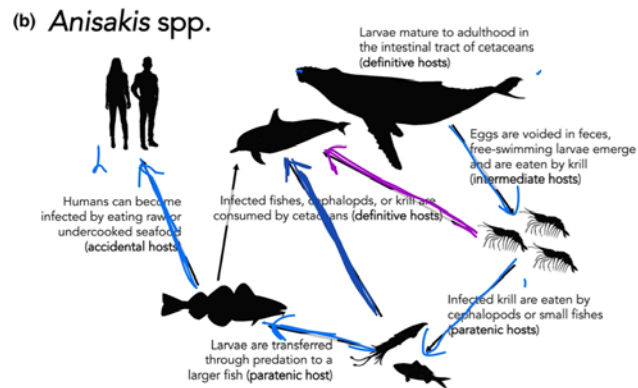
UNIVERSITY OF WASHINGTON

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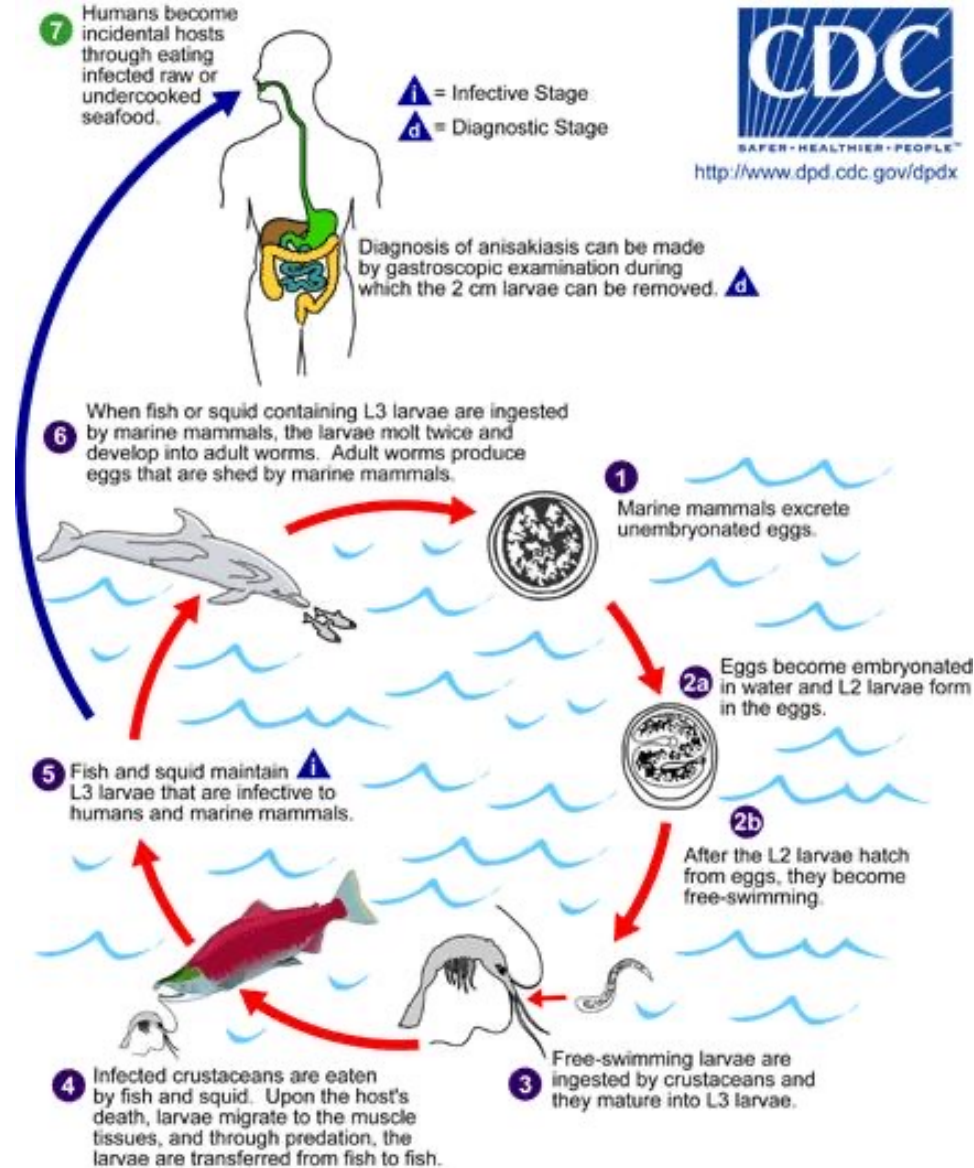
So how could Anisakis come into your body?



Human seafood consumers often discover their infection status when they find live worms in their phlegm, mucus, vomit, or feces and in serious cases, symptoms include acute abdominal pain, nausea, vomiting, and diarrhea, which can persist for months

The worms cannot successfully reproduce in the human intestinal tract, but they can survive there temporarily and cause substantial pathology





I will shortly give an example of how could human became the accidental host of Anisakis:

- Eggs from the adult worms are released in the feces of their **marine mammal definitive hosts** and infect **small crustaceans** that consume the parasite eggs or larvae .
- These first-intermediate crustacean hosts are then consumed by **fishes, cephalopods, or other crustaceans**
- Next, they could get into their final hosts' body through the transmission to a **paratenic host, or to a marine mammal definitive host**—and where they may then be incidentally intaken by **humans**.

So what will happen after it comes into your body?



- **For humans**

- The Anisakis causes symptoms **like food poisoning in humans**, such as nausea, vomiting and diarrhea, and they can also lead to **allergic death**.
- Misdiagnosis is common, as symptoms **resemble** those of many **gastrointestinal ailments**.
- These worms **cannot successfully reproduce** in the human gut, but they can survive there temporarily and cause substantial pathology.



- **For Marine mammals**



- Marine mammals may be **more vulnerable than humans**, and these tiny but numerous parasites could be the **last straw that breaks the camels for some of the endangered species.**
- The worms have been found in many marine mammals that have died from stomach blockages or ulcers.



- **In other parts:**

☞ **It can change public perceptions of seafood safety.**

- In 1987, for example, the German news broadcaster broadcast a video of a live worm being released from a fish fillet, causing an **immediate 80 percent drop in Seafood sales** in Germany and the loss of fishery-based jobs.

It could threaten the viability of fish populations and the profitability of the fisheries.

- Anisakis present a threat to the health of their fish intermediate hosts and associated fisheries and **causes severe economy loss** to the related industries



The reason of increasing



Anisakis has been nearly 300-fold increased in the past few decades



climate change

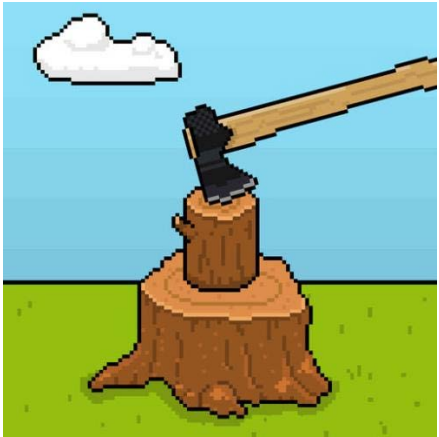


Changes in Marine species richness



Increased human activity

1. Increased human activity



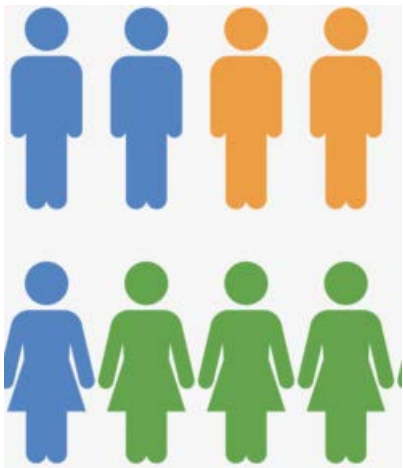
Human
agriculture
and
Other
activities



large amounts of
nutrients
discharge into
coastal ecosystems



eutrophication of
water
bodies



An increase
of the
Anisakis



An increase of the
number of copepods
and other
zooplankton
crustaceans



2. Changes in Marine species richness



1972: The Marine Mammal Protection Act



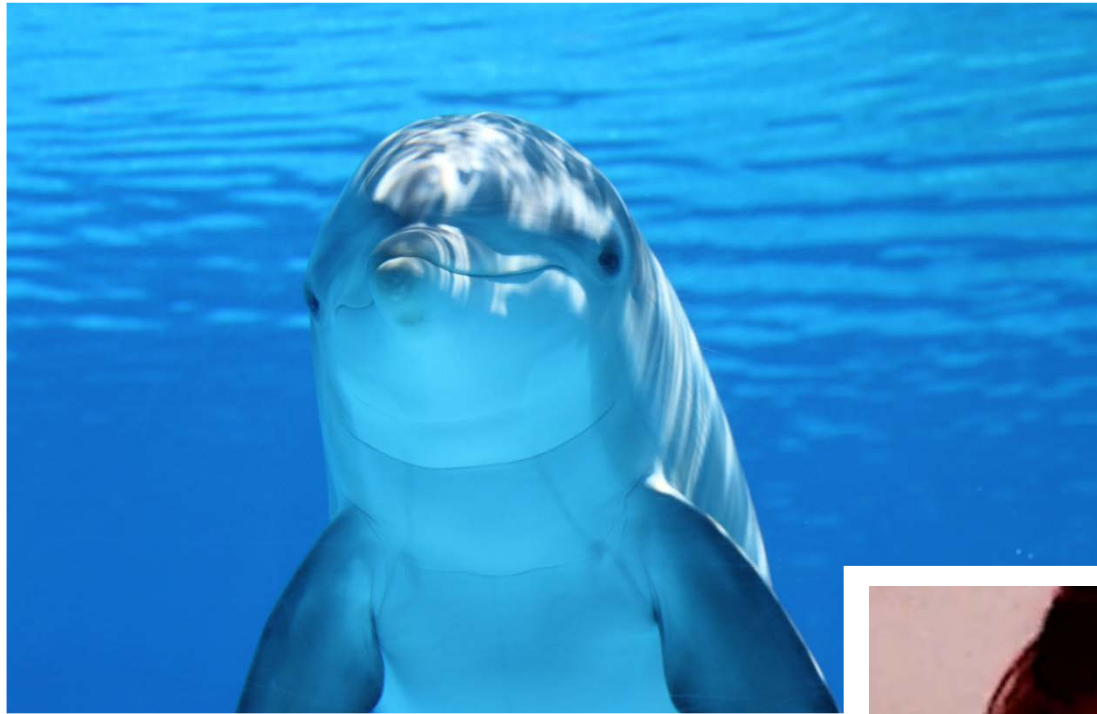
1982: many countries have complied with a moratorium on commercial whaling imposed by the International Whaling Commission



The increase of the eventual host population



An increase of the Anisakis



If the outbreak of Anisakis has already caused so many troubles to us and marine mammals, **what actions** should be taken to ease this situation?

Are the ocean parasites like Anisakis **only act as ghosts** of marine ecology and human health which should **be cleared off**?





Does it exactly mean we need to vanish them?

Support

- reduce rates of human mortality and disability
- improve our life qualities
- benefit livestock production and wildlife conservation

Oppose

- parasites will influence host immunity
- parasites affect the rate of host population growth and total population size
- Parasites alter the cycling of energy and nutrients and the across-ecosystem subsidies

1 Firstly, parasites will influence host immunity.

The absence of parasites would impair the host's immune system. Hosts that initially lost their immunity would later be susceptible to re-infection by newly evolved parasites.



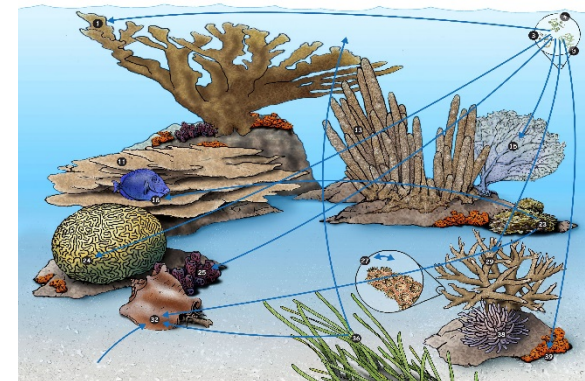
2 Secondly, many parasites affect the rate of host population growth and total population size.

According to the “enemy release hypothesis”, when a species is introduced into a region to which it is not native, it experiences weaker population regulation by natural enemies than it would in its native range.

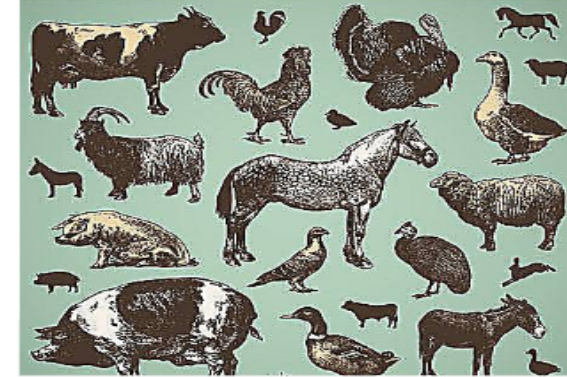
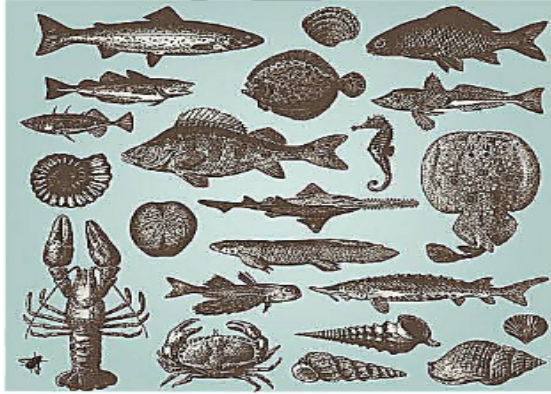


3 Thirdly, parasites are far more numerous than their hosts.

Parasites alter the cycling of energy and nutrients and the across-ecosystem subsidies. In many cases, parasites' manipulation of their hosts to move from habitat preferred by the host to habitat suitable for the parasite can result in a transfer of energy and nutrients from one ecosystem to another.



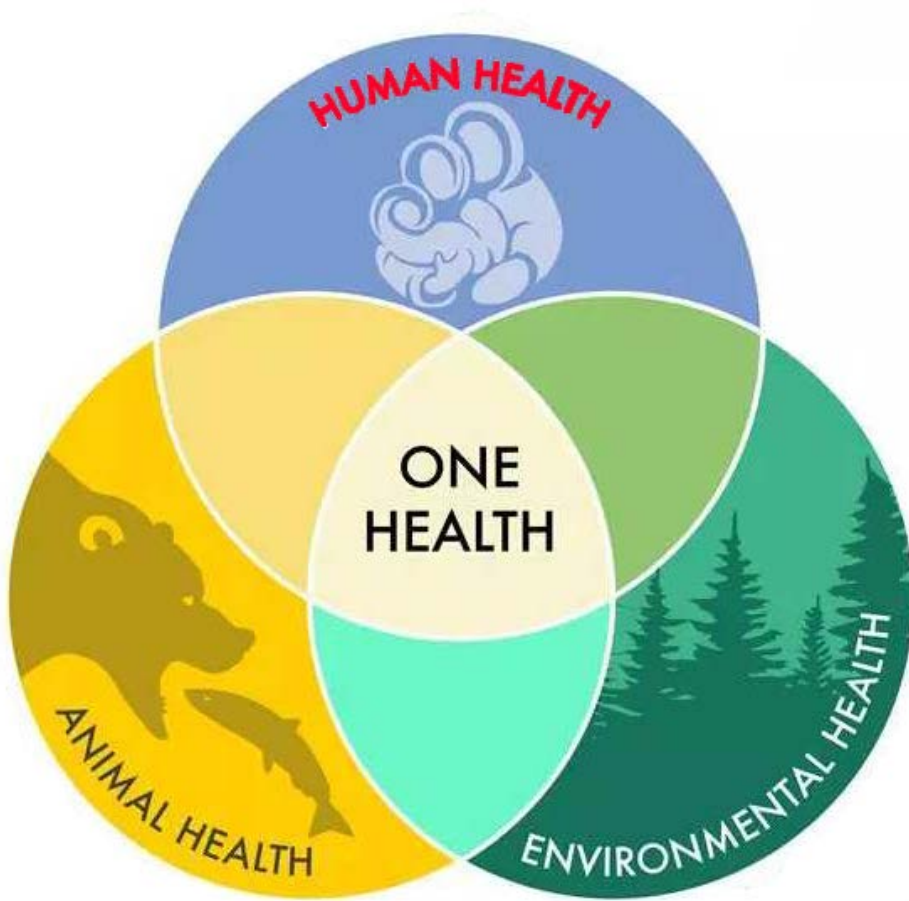
parasites



Although parasites are important parts of the ecosystem, we cannot allow them to spread freely without any limitations. Though marine parasites belong to the sea, but it isn't impossible for them to spread to terrestrial ecosystem.

When we intake raw fish food such as sushi or sashimi, we actually potentially promote their dissemination to the terrestrial ecosystem. It will not only harm our health, but also increases the risk of marine-to-land transmission of marine parasites.

So if the *Anisakis* does harm our health while we couldn't simply control the amount of them through human intervention, how could we still reach the one health goal under this circumstance?



- **Human health** is also an important part of the **One Health**.
- We should take **practical actions** to safeguard One Health.

An overall harmonious state between human and all things in nature.



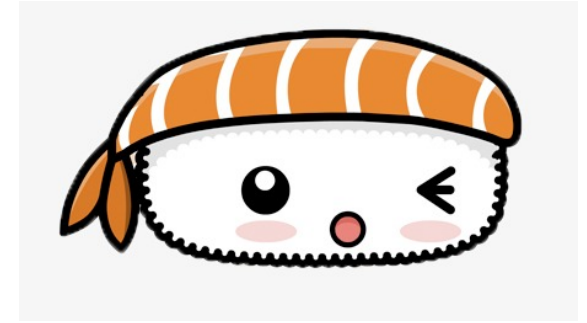
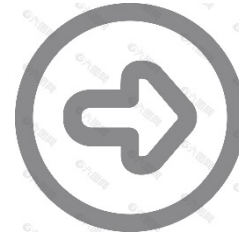
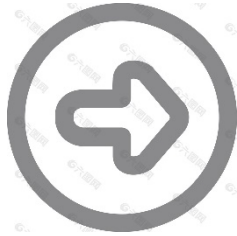
Reduce the consumption of sushi, sashimi and other foods that are likely to infect us with parasitic diseases.



Interfer with parasites too much.



In other aspects of our diet, we should also eat foods that have been processed in accordance with the law to ensure our own safety.



- **In America**, the supplier must provide a written statement stating that the fish has been frozen to -20°C for 7 days or -35°C for 15 hours in accordance with regulations.
- **EU also has similar regulations** that provides a safer situation for people when they enjoy uncooked fish.
- **China enforce a new regulation** for salmon in 2018, called Raw Salmon, which indicating that China becomes taking it seriously and trying to keep pace with the developed countries.



However, regulations can't keep us away from parasites absolutely.

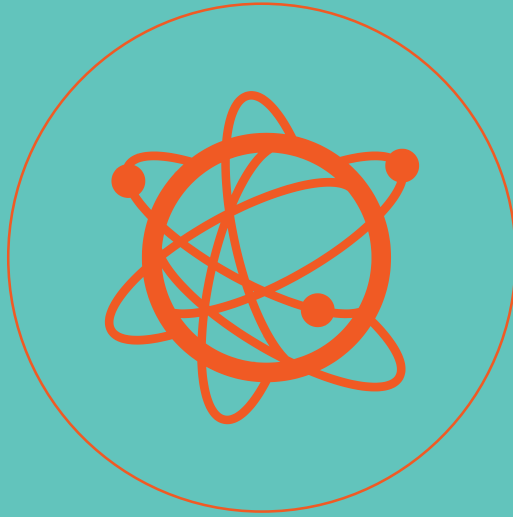
- Many experienced cooks who have worked in sushi related fields for decades, claimed that they can **always find worms like Anisakis** when they are dealing with fish.
- And it's proved that **though the parasites have been killed by freezing, they can elicit gastrointestinal symptoms if you consume these infected fish.**
- So the **best way** to stay safe from parasites is to consume raw fish production as little as possible.



Human activities may potentially promote the outbreak of Anisakis

- Fertilizer using causes the eutrophication of sea water
- Emit too much greenhouse gas which causes the serious global warming may all contributes to this uncommon phenomenon





Offline promotion

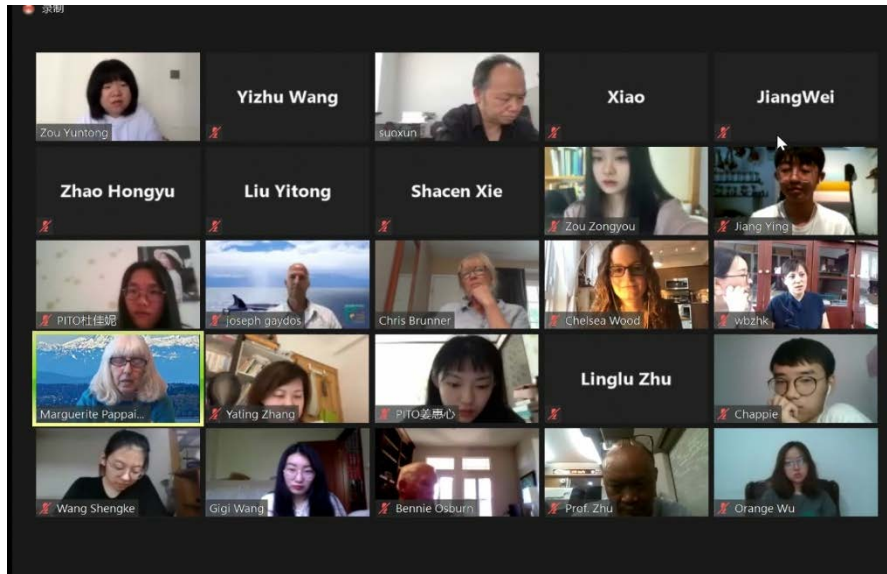
Southern Sea Otters

- Occur in nearshore habitats
- Land use AND other anthropogenic factors influence disease
- Cyanobacteria and microcystins
- *Toxoplasma gondii*



Ghosts of oceans past:

What can data on historical parasite burdens tell us about the future of marine disease?



Part 1. International workshop

Preparations



PRIMARY RESEARCH ARTICLE

It's a wormy world: Meta-analysis reveals several decades of change in the global abundance of the parasitic nematodes *Anisakis* spp. and *Pseudoterranova* spp. in marine fishes and invertebrates

Evan A. Florenza, Catrin A. Wendt, Katie A. Dobkowski, Teri L. King, Marguerite Pappaionou, Peter Rabinowitz, Jameal F. Samhour, **Chelsea L. Wood**

First published: 19 March 2020 | <https://doi.org/10.1111/gcb.15048>



Dear and respectable Professor **Chelsea Wood**:

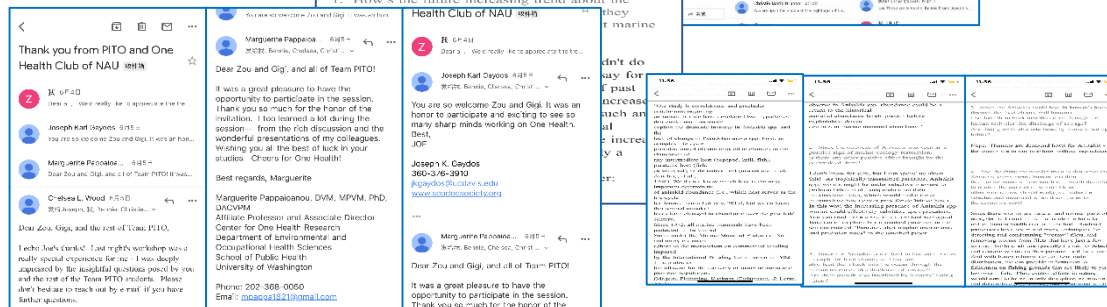
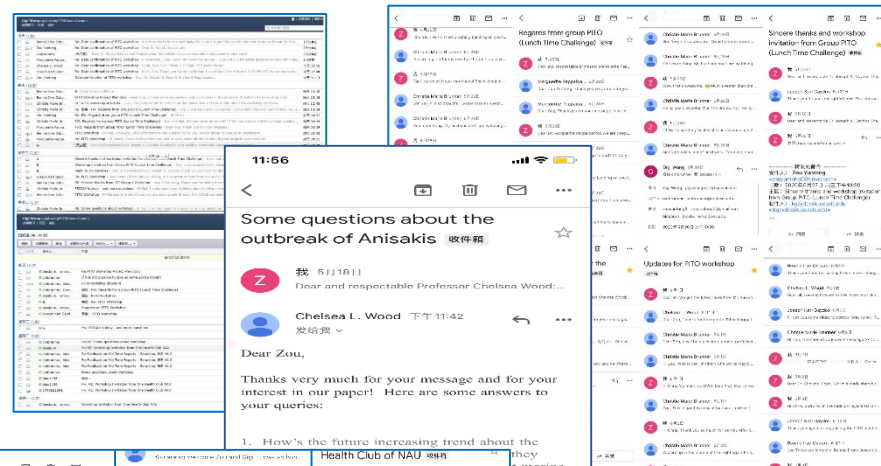
This is a letter of consulting some questions about the paper *It's a wormy world: Meta-analysis reveals several decades of change in the global abundance of the parasitic nematodes Anisakis spp. and Pseudoterranova spp. in marine fishes and invertebrates* on Wiley Online Library.

My name is Zou Yuntong, a sophomore student from Nanjing Agricultural University and majoring in veterinary medicine, I've always quite interested in marine ecology and zoonosis. Recently we are doing the Lunch Time Challenge with the University of California, Davis, which aims to solve some daily problems by interdisciplinary team

1. Got in touch with the paper corresponding author
Our core document of mid-term presentation is "It's a wormy world", we successfully contacted the author who helps a lot to solved our problems.

2. Preparation for the workshop

During a whole week hard working and with the kind help of One Health Club NAU and UC, Davis, we finally invited the professors from both abroad and dominant.



Workshop Quality



Chinese Academy of
Agricultural Science

Lanzhou Veterinary Institute

China Agricultural University

University of California, Davis

Nanjing Agricultural University

University of Washington



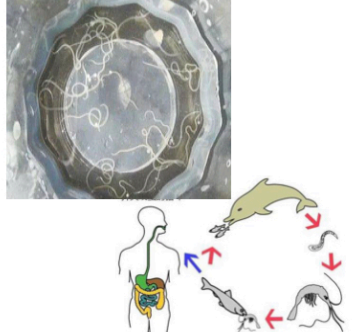
It is our great honor to invite professors from domestic and abroad to participate in this workshop. We benefit a lot from the blending of Chinese and Western thoughts.

Influence & Effect

PITO
Ying Jiang


My mission to propose some feasible measures to solve the problems.

By referring to the literature and combining my own knowledge, I understood the relevant laws and regulations of marine parasites, and I am basically aware that the prevention and control of market management needs to be improved, in that case we can prevent parasitic diseases from the source.




PITO
Linglu Zhu

Environment



Some measures to protect the water environment are already put into use, but the situation is still severe.

Animal




As we know, the parasite is bad for people's health, there are few research on the harm of parasites to animals

Mid-term presentation

After the workshop



PITO
Linglu Zhu

 Does it exactly mean we need to vanish them?

Support

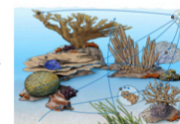

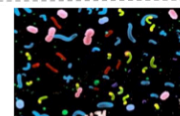
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PITO
Linglu Zhu

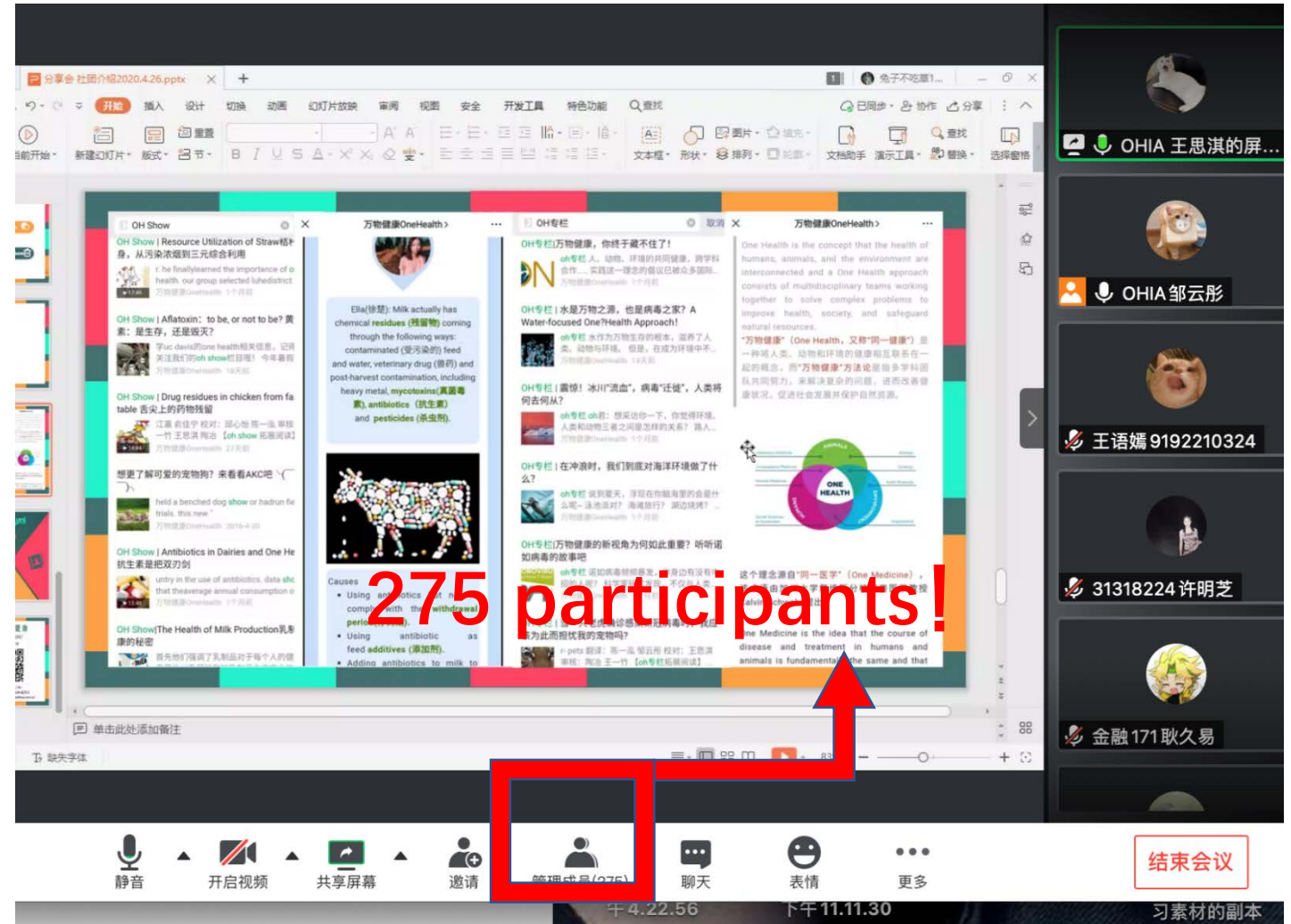
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Final presentation

We learned to solve problems more dialectically and believed that a better understanding of how parasites contribute to the communities and ecosystems in which they are embedded is a critical need as we consider how to make the world less wormy.

Part.2 Subsequent Seminar For The Whole University



1.Promotion through WeChat official account

(200+views in total)

Workshop preview

Workshop|舌尖上的“虫”——究竟是人类的营养宝藏还是健康灾难?

万物健康OneHealth 6天前



IBF&PITO

注意！前方高能疑问句预警！

你想知道昆虫除了油炸还有什么食用方法吗？

你想知道食用昆虫有哪些优点吗？

你吃的寿司和生鱼片还是安全的吗？

你想知道舌尖上的虫背后都包含着什么秘密吗？

Promotion before activity



Workshop|舌尖上的“虫”——究竟是人类的营养宝藏还是健康灾难?

当提到舌尖上的“虫”，你会谈其色变吗？

Promotion after activity



精彩回放|舌尖上的“虫”——究竟是人类的营养宝藏还是健康灾难?

线上workshop,为你带来不一样的认知碰撞!

Workshop review

精彩回放|舌尖上的“虫”——究竟是人类的营养宝藏还是健康灾难?

万物健康OneHealth 前天



奇怪的知识增加了!

在6月7日晚的分享会中，相信小伙伴们都学到了很多知识吧？

可能你们中不少人惊叹：

啊，原来我喜欢的寿司里可能有寄生虫？！

啊，原来虫子还能做成能量棒吃掉，还是鸡肉味嘎嘣脆？！

啊，原来One Health社团有这么多宝藏学长学姐？！和加州大学戴维斯分校有着千丝万缕的联系？！

2.Promotion through QQ official account zone (700+views in total)



Thanks for your listening!