

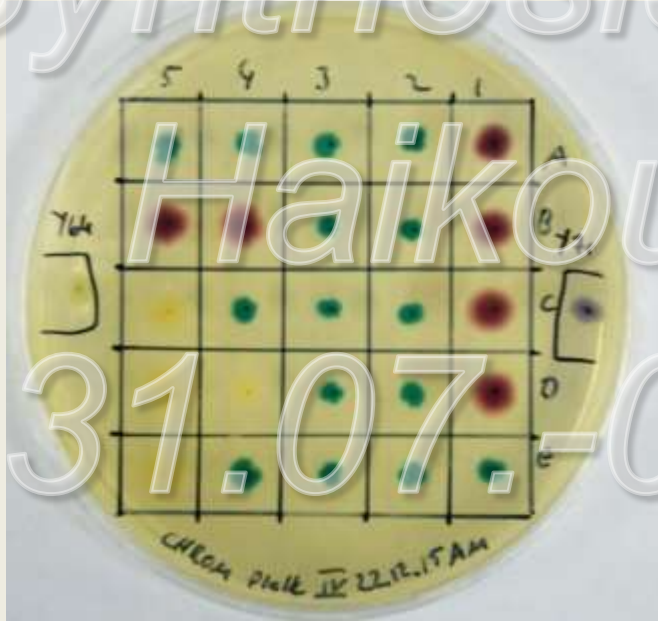
## ECOLOG – SP2

Impact of aquacultures on their bacterial communities and surrounding coastal systems, with focus on potentially pathogenic Vibrios

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*Haikou, Hainan*

*31.07.-01.08.2018*



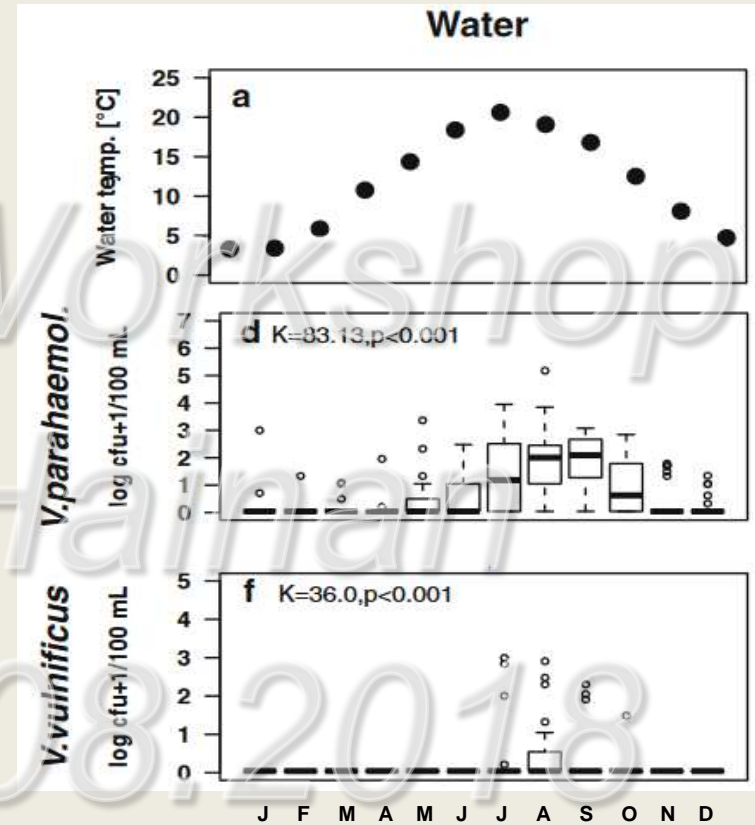
Lars Möller

- One of the oldest described bacterial genus
- Gram negative, facultative anaerobic
- Curved rod shaped, motile
- Lifestyles from symbionts and pathogens  
(Elyakov et. al 1991, Farmer Iii and Hickman-Brenner 2006,  
Jayasree et. al 2006)
  - Corals
  - Higher organisms (fish, shrimp, shellfish...)
  - Humans



# Introduction - the genus *Vibrio*

- Most species halophilic (preference 15 - 25‰)  
(Givens et. al 2014, Randa et al. 2004)
- Ubiquitous distributed in aquatic systems (0.1 – 0.5%  
of bacterial community)  
(Thompson et al. 2004)
- Tendency to warmer regions  
(Saha et. al 2014, Vezzulli et. al 2009)



Modified from Böer et al. 2013

- Aquaculture one of the strongest growing sectors

( $\approx$  100 % in the last 10 years)

- World production: 110 208 218 t

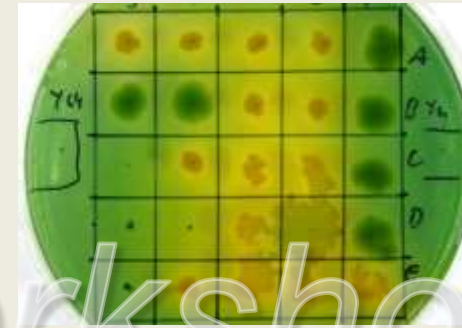
(Food and Agriculture Organization of the United Nations, 24.07.2018)

- Hainan one of the most productive regions





- Bacterial community composition change in aquacultures (Moriarty 1998)
- Vibrios can be enriched in aquacultures (Moriarty 1998)
- Water often unloaded directly in to the ocean/river
- Potential impact on surroundings



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Impact of aquacultures on bacterial communities within and adjoining coastal ecosystems

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Abundances (and diversity) of marine *Vibrio* spp. in aquaculture systems and dispersal in coastal ecosystems

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- Samples alongside the shore: water, sediment, seagrass
- From aquacultures: water, sediment, animals, (isolated bacteria from aquacultures)

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# Sampling campaign





- In total: 59 sampling stations

- 20 aquaculture samples

- 39 transect samples

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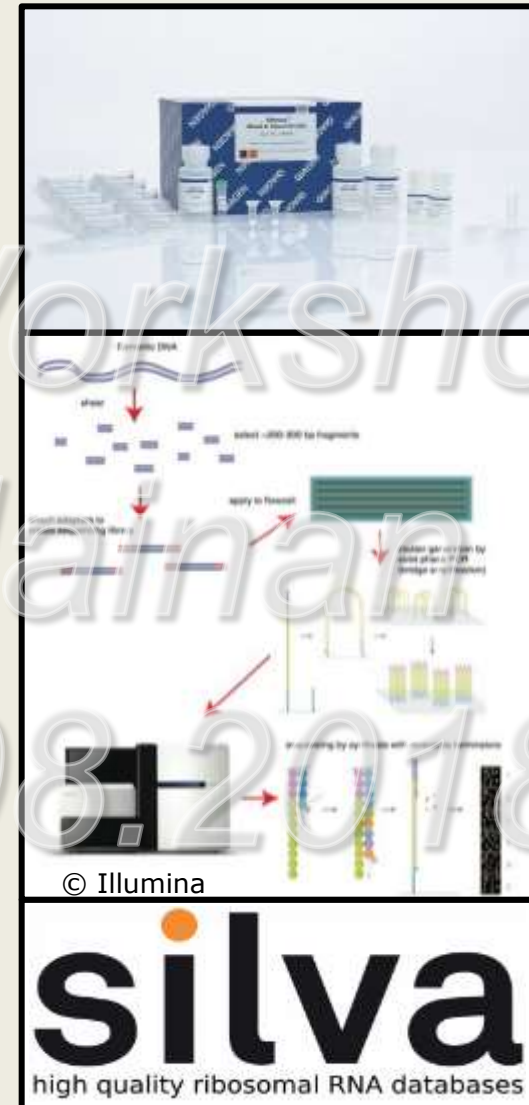
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- DNA extracted

- Illumina sequencing of the bacterial  
16S rRNA gene

- bioinformatic processing of the  
50,000,000 sequences



- Aquaculture can impact the bacterial community composition

- *Vibrio* can be enriched in aquacultures

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- combination of data from different groups (nutrient values)

- identification of additional model organisms

- antibiotic resistance of isolated *Vibrio* spp.

- bacteriophages as antibiotic replacements

- waste water cleaning process

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Members of the ECOLOC  
Group

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**Thank You for Your  
attention**

*Haikou, Hainan*

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