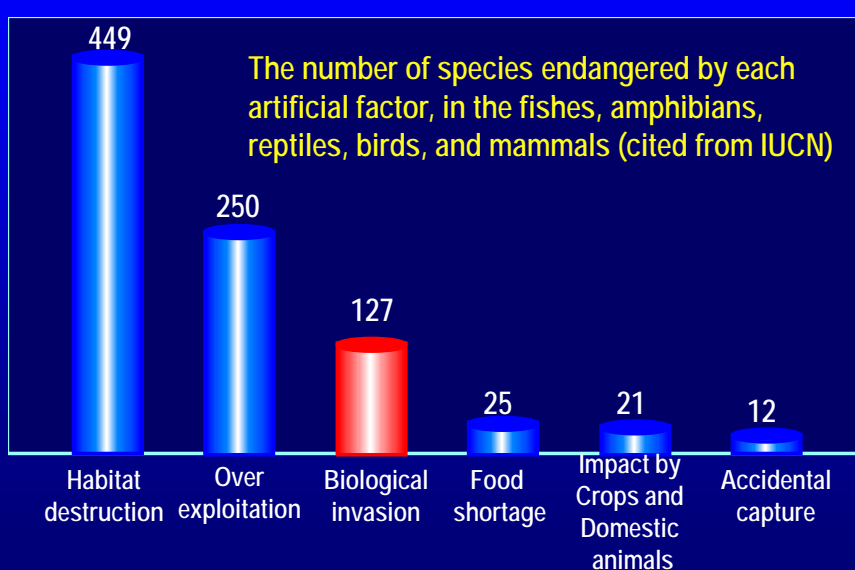


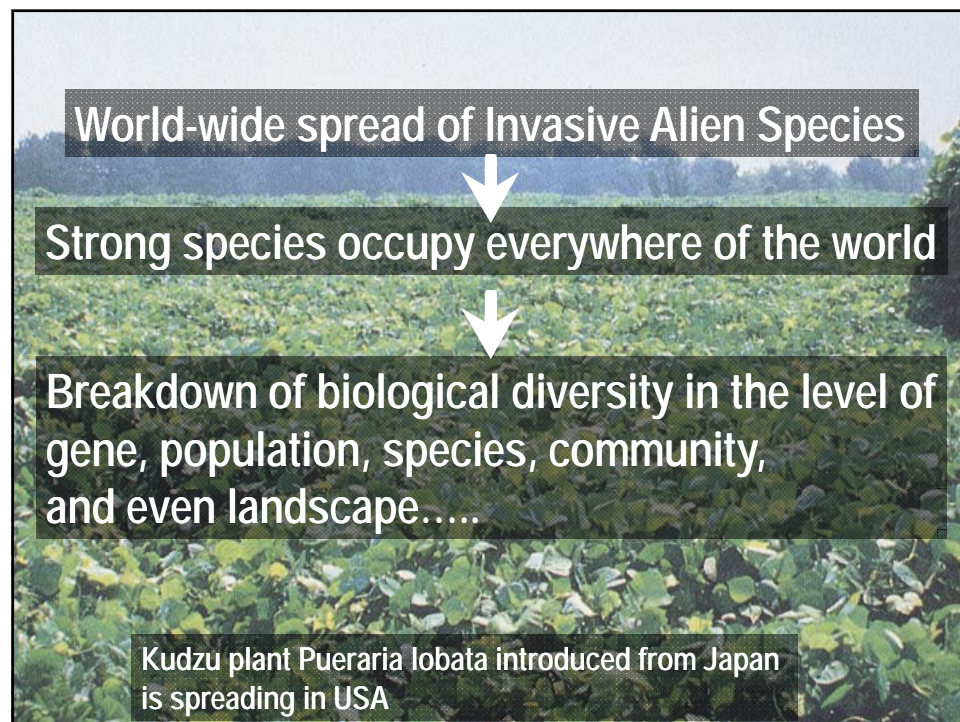
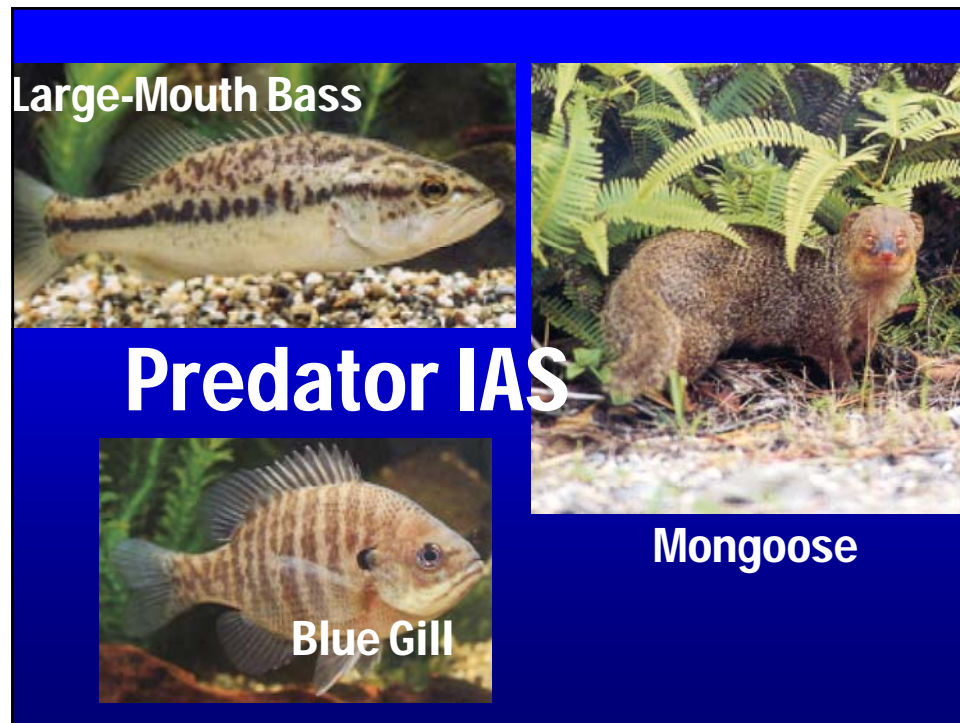
Mitigations of Negative Impacts of IAS to Endemic Ecosystems and Ecosystem Services – the struggles in Japan

Koichi GOKA

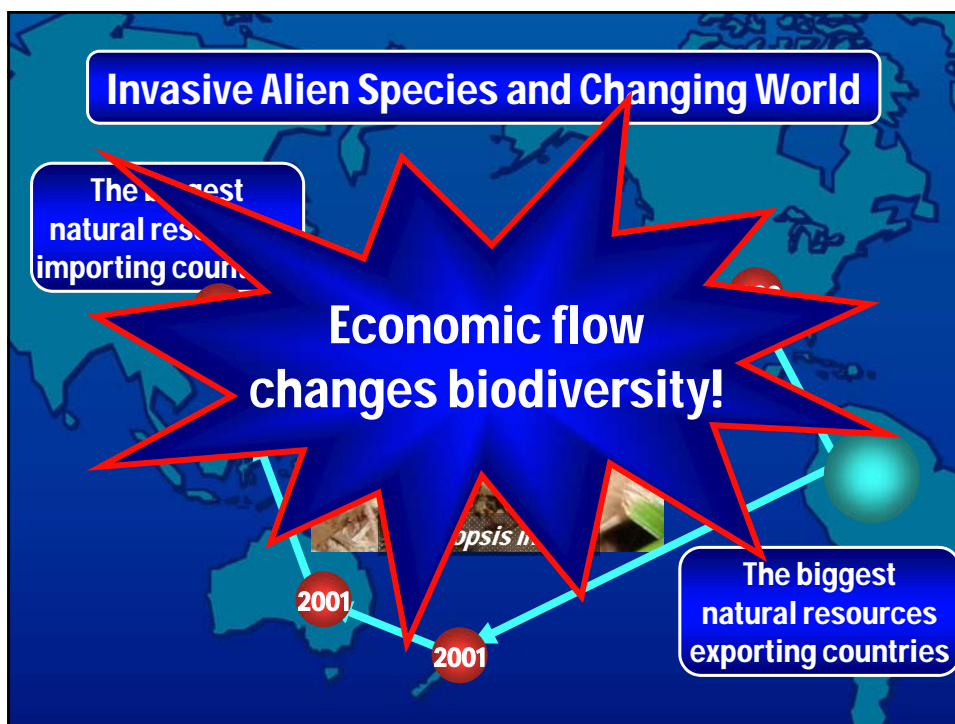
AVP

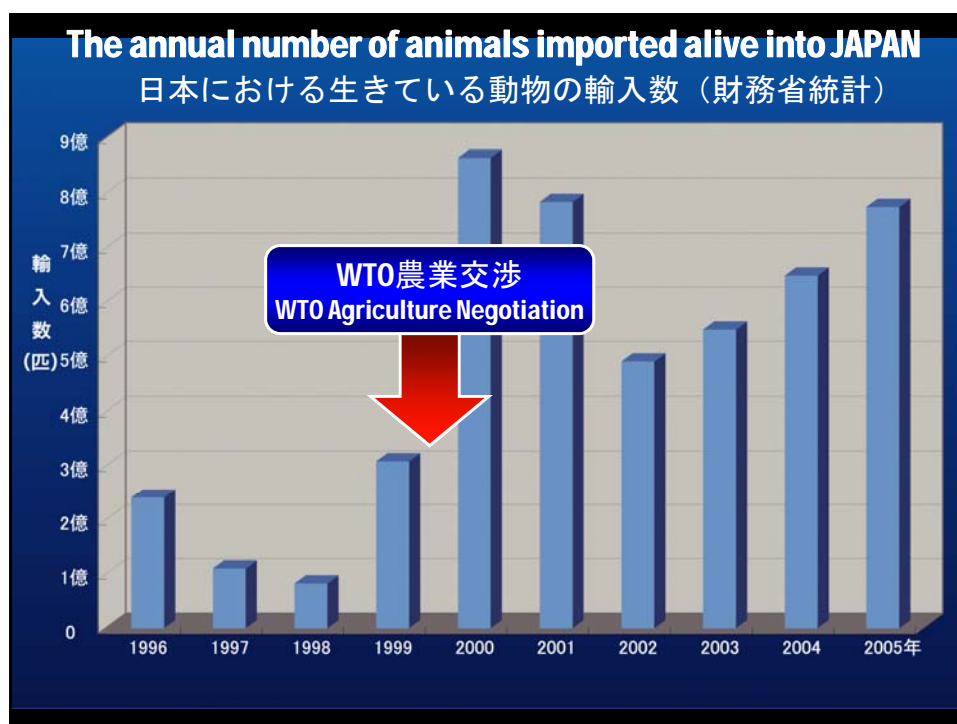
The factors causing extinction of wildlife

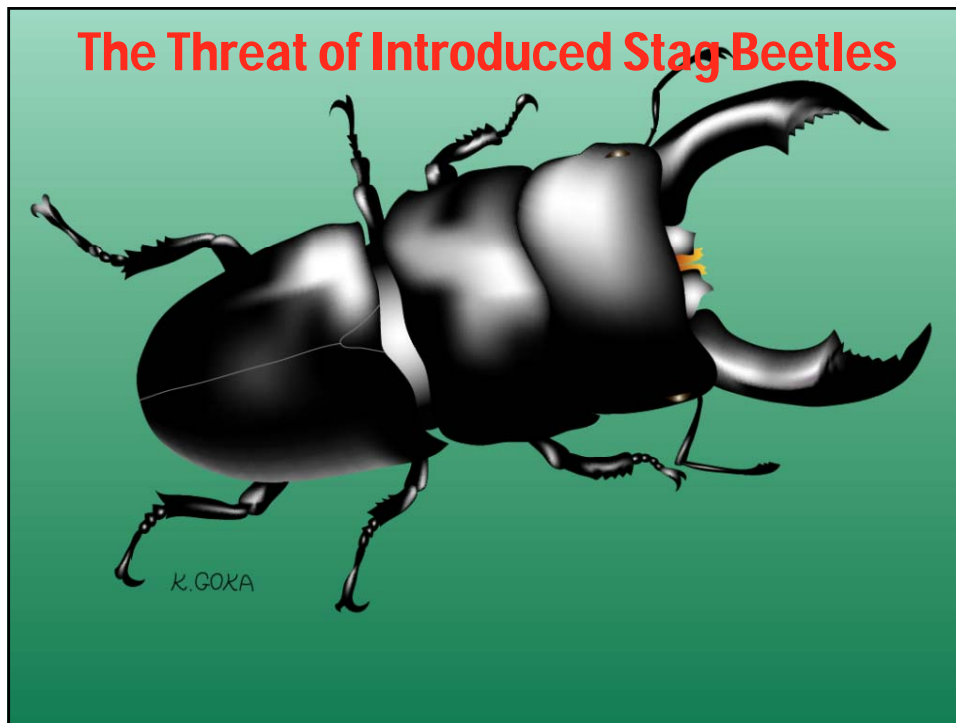












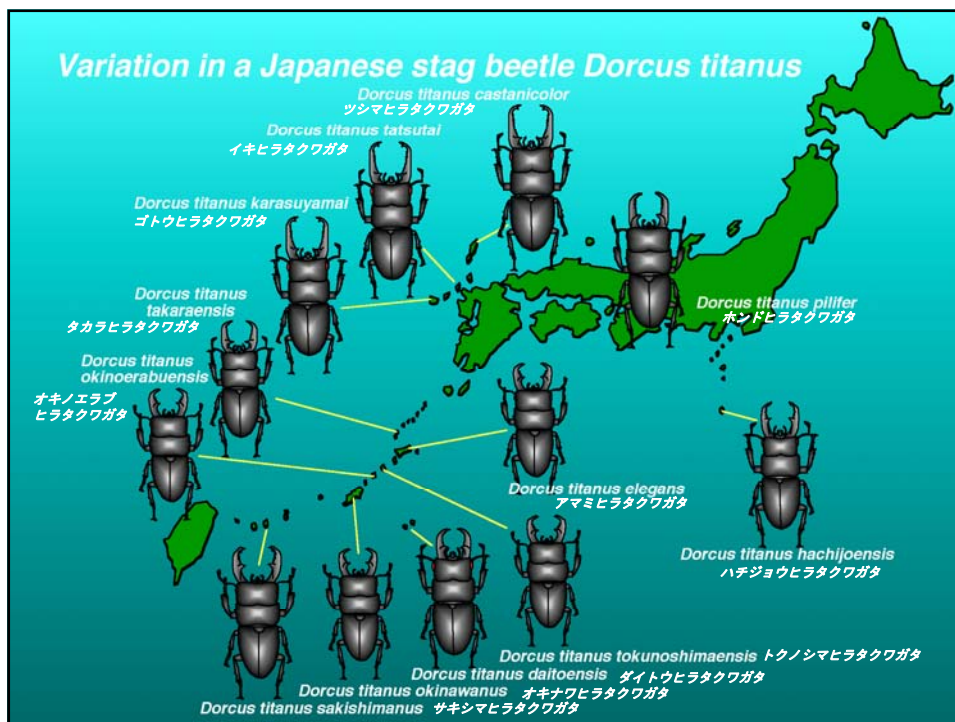


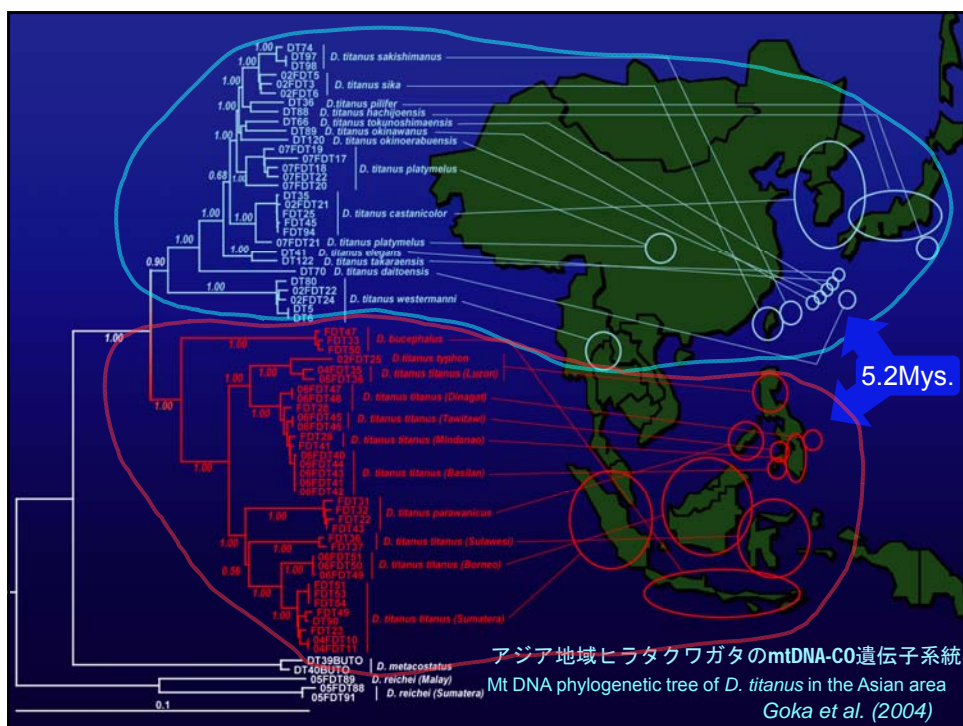
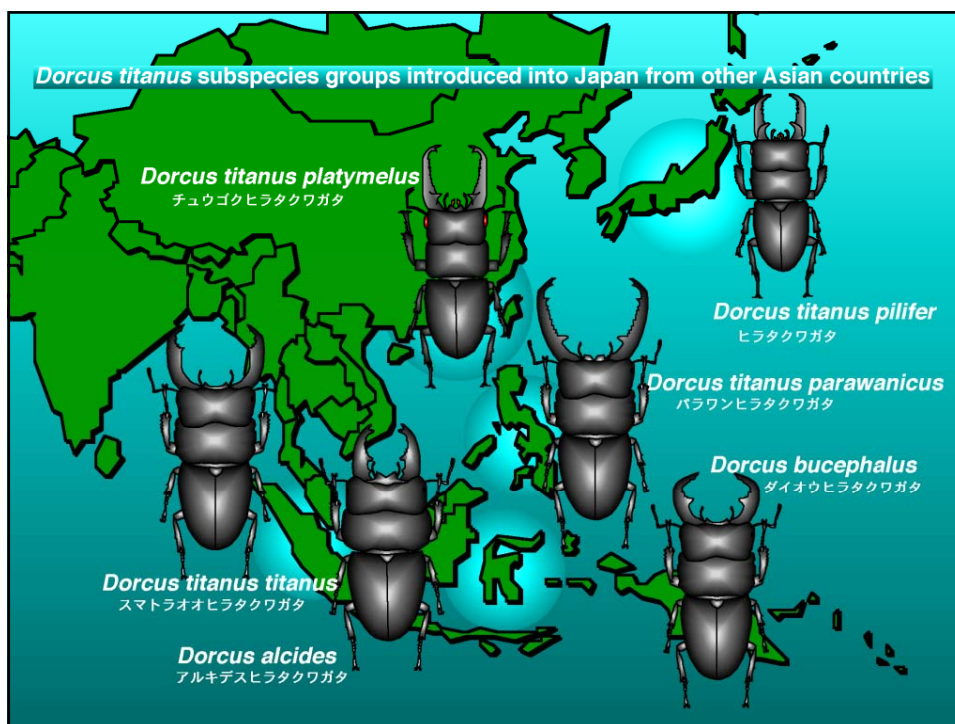
If the exotic stag beetles come to be naturalized . . .

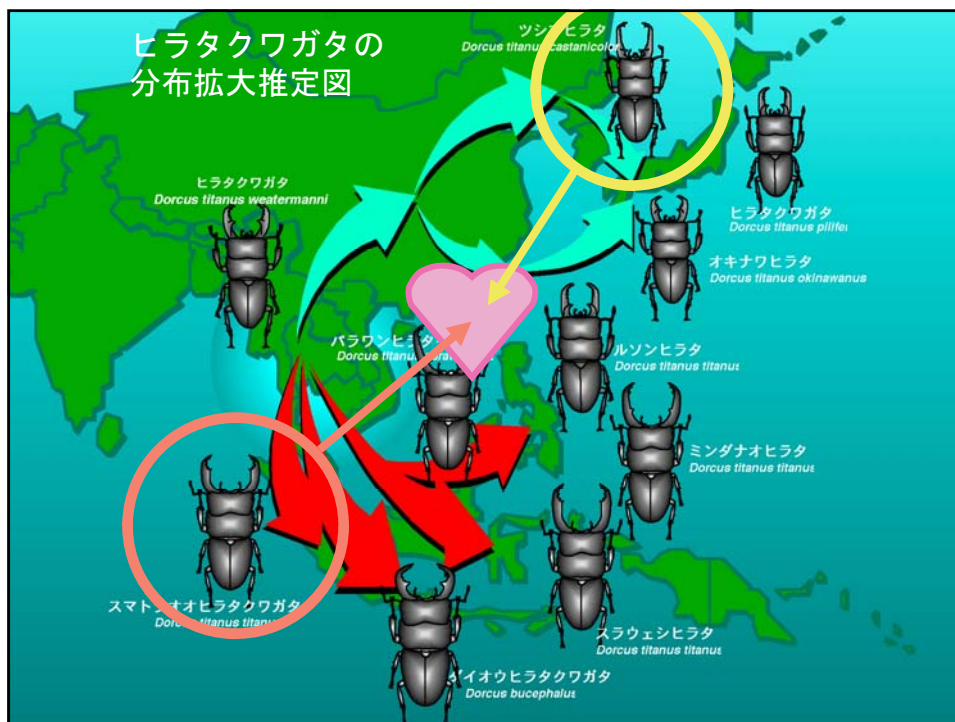
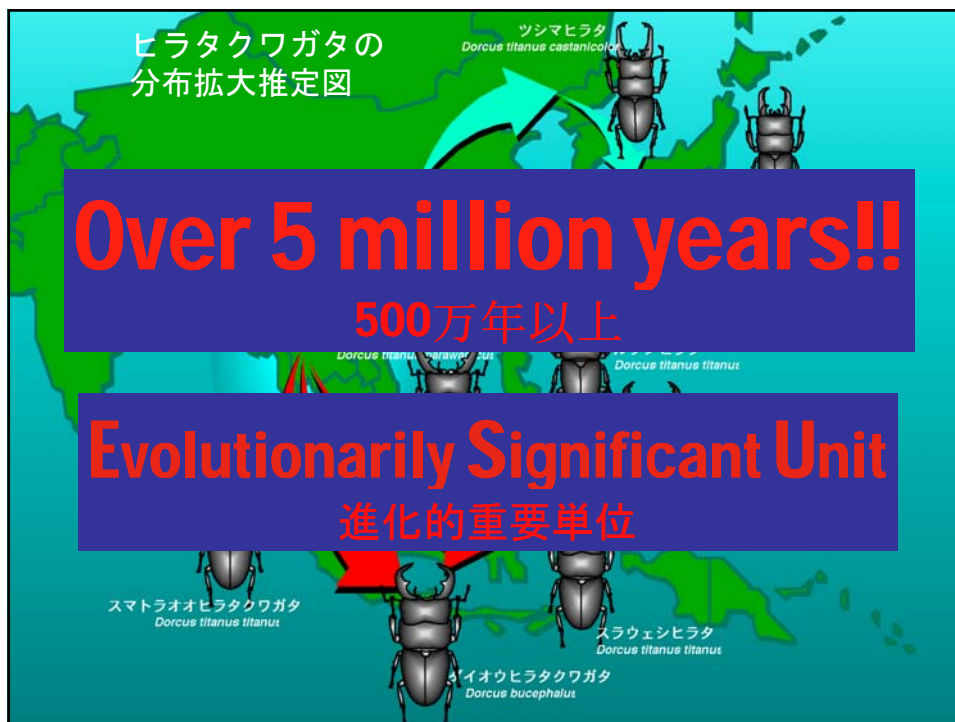


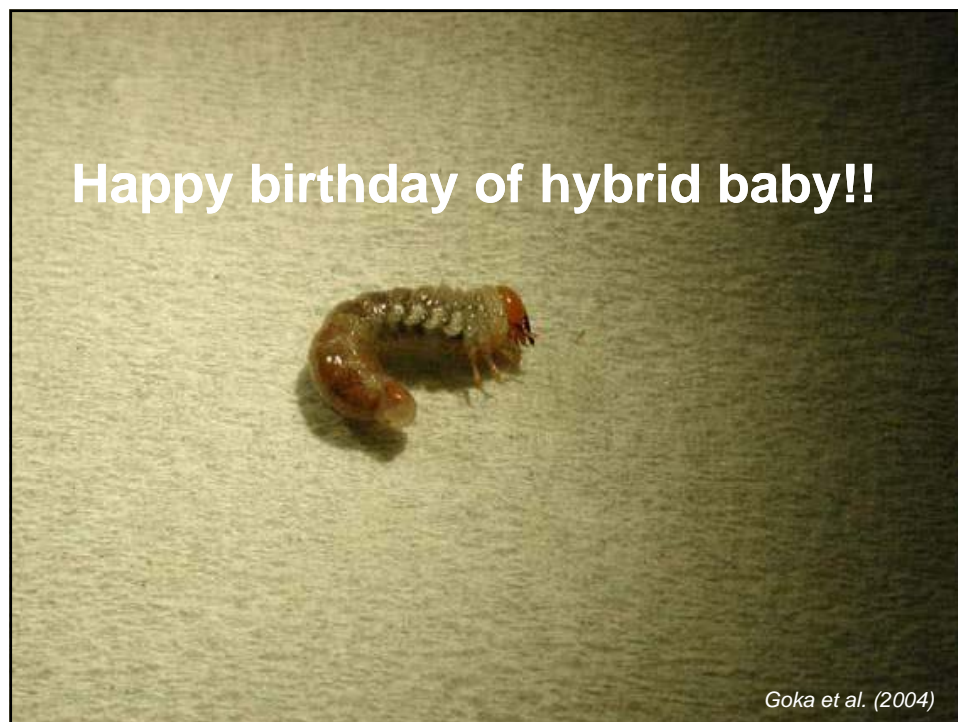
Ecological impacts will be caused on the native species

Variation in a Japanese stag beetle *Dorcus titanus*

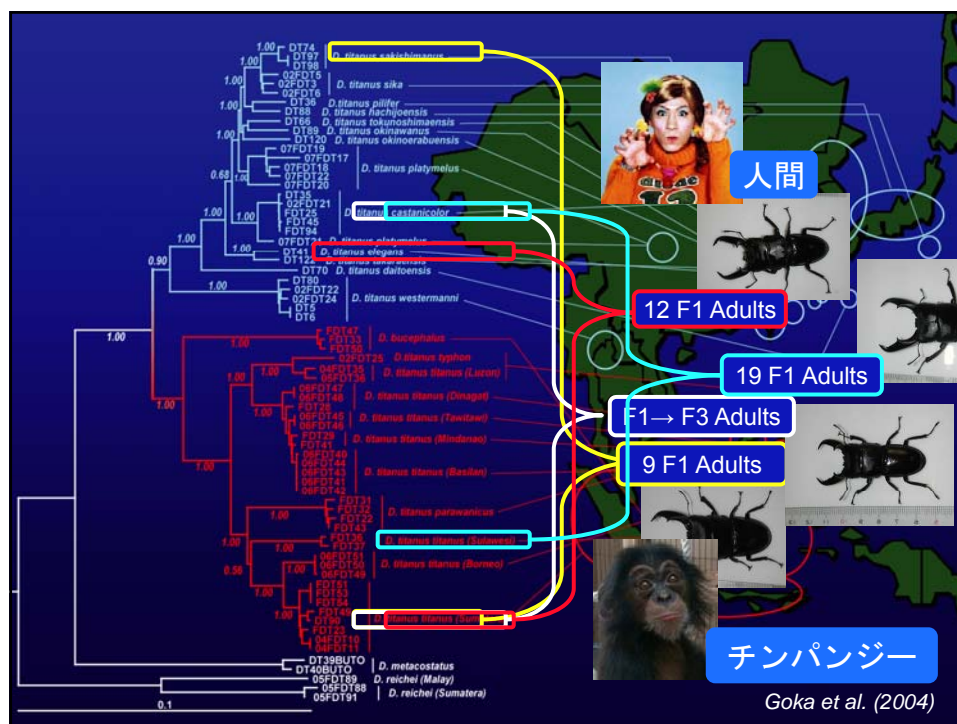










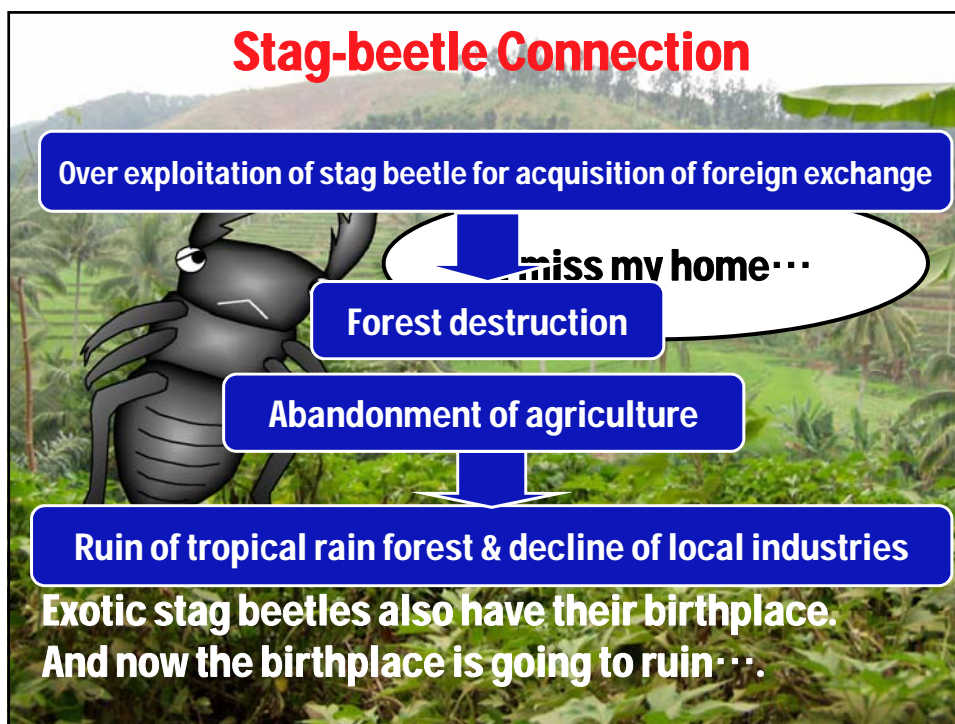












Beetle Battles

EDITED BY CONSTANCE HOLDEN

Collecting stag beetles is a long-established hobby for Japanese boys. But things are now getting out of hand: Thanks to an arcade game called Mushi (insect) King, the beetles are all over Japan, and one subspecies is becoming endangered in its native habitat in Turkey.

In Mushi King, players collect cards with the picture and vital statistics of one of various beetle species. By inserting the card into the game machine, players control their bug in virtual fights. The game has spurred interest in exotic beetles, leading to imports of more than a million a year, according to Koichi Goka, an entomologist at the National Institute for Environmental Studies in Tsukuba. Prize bugs sell over the Internet for \$400 or more.

This year's hottest beetle is *Lucanus cervus akbesianus*, a rare subspecies found only in the Amanos Mountains of southern Turkey. The Amanos Environmental Protection Association has warned that overharvesting is pushing this beetle toward extinction.

In Japan, meanwhile, Goka worries that the beetle battle might move into the real world if the aliens escape and breed, with the big foreign bugs muscling out their weaker domestic rivals. "It is not an actual problem yet, but there is a big risk," Goka says. But, he says, the Environment Ministry hesitates to designate stag beetles as an invasive species because "the market has already become too large to control."

Hot beetle.

and physics heavyweight Hans Bethke recalls J. Robert Oppenheimer, who headed the Manhattan Project, says: www.nobelprize.org/robertoppenheimer?pagename=MEMOIRS_A

Our Ancestral Brains

Evolutionary psychologists have come up with a new piece of evidence that we are still operating with our old hunter-gatherer brains: We notice animals more than we notice objects. Graduate student Joshua New, along with John Tooby and Linda Cosmides, both of the University of California, Santa Barbara, theorized that human beings have evolved a "category-specific" attention system that pays especially close heed to other animals. To test the idea, they showed volunteers scenes for a fraction of a second and then the same scenes with changes in the position of an animal or

recruit a surprising amount of attention—as do turtles resembling rocks," Tooby says.

WORLD OF WATER

Replicas of distinctive towers that rise from California's extremely salty Mono Lake will be featured at a major exhibit on water at the American Museum of Natural History in New York City. The massive pillars, of a type of limestone called tufa, form underwater from an interaction of calcium from freshwater springs with carbonates in the lake water. Up to 10 meters high, they now poke out because of water diversions.

The exhibit, called Water: H₂O = Life, is designed to explore water from every angle, from its various cultural and spiritual aspects to the shortage of clean water facing most of the world's poor. It opens on 3 November and leaves for a world tour next June.

above) more often than in the van (below).

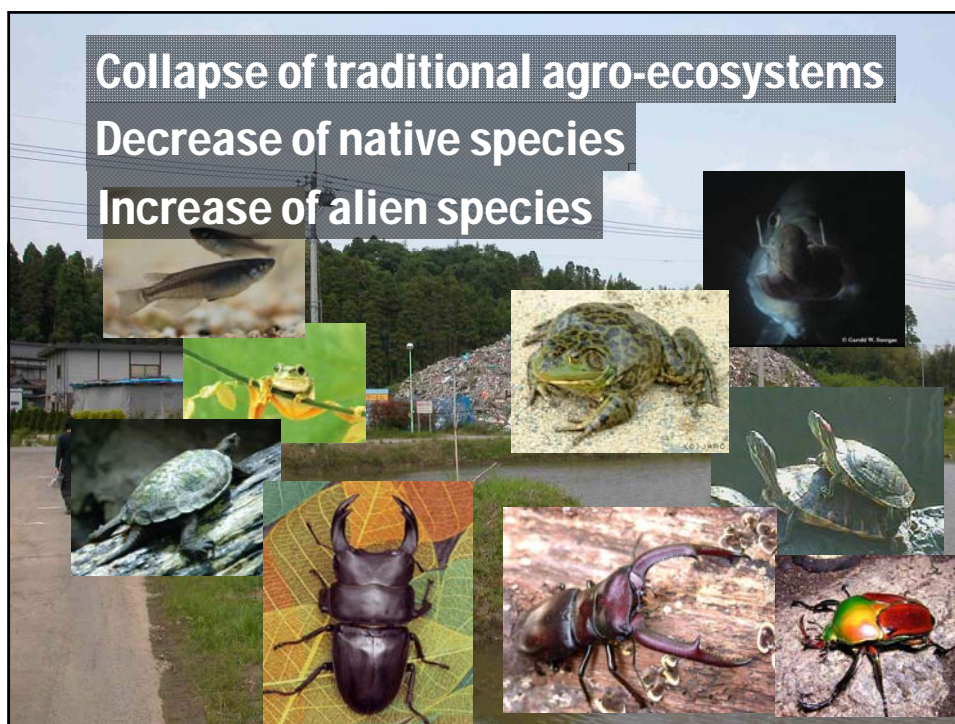
www.sciencemag.org SCIENCE VOL 318 5 OCTOBER 2007 25









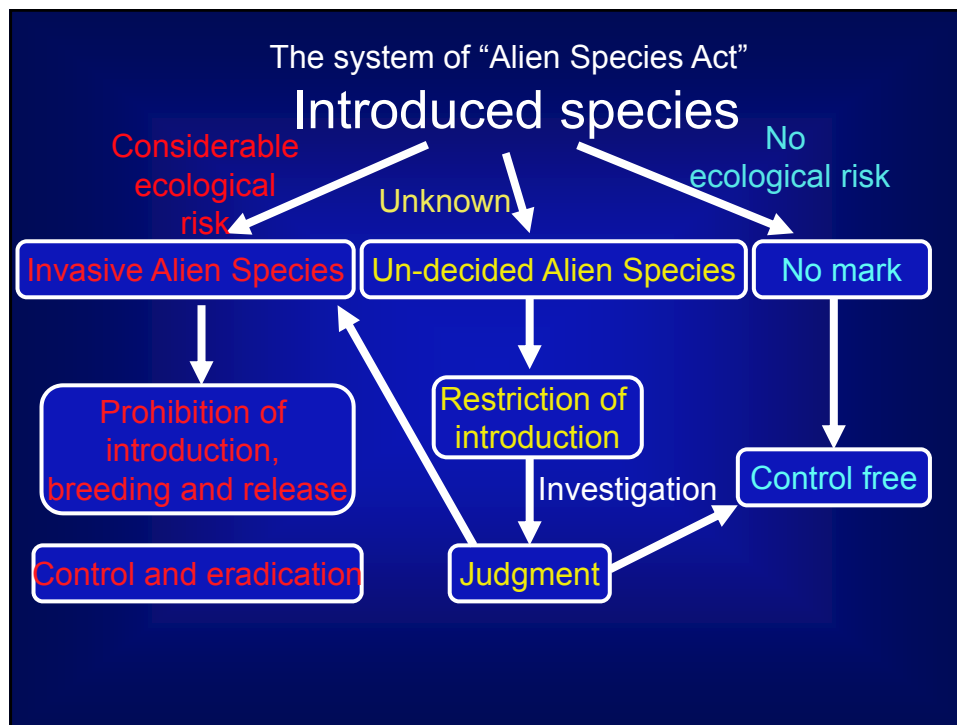


環境省

The Ministry of Environment

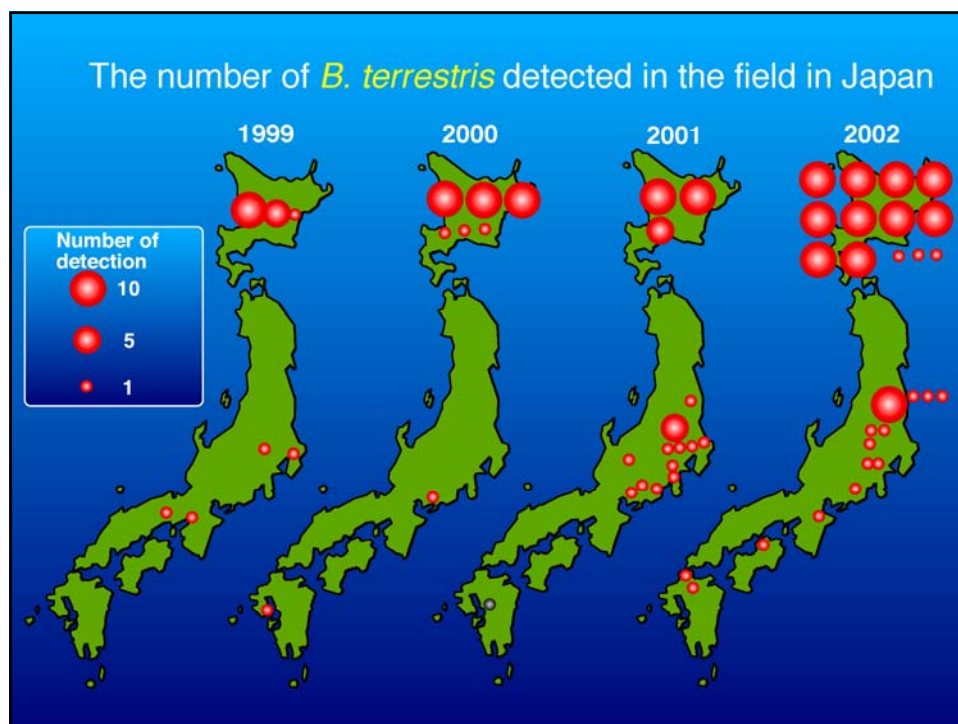
「特定外来生物による生態系等に係る
被害の防止に関する法律」

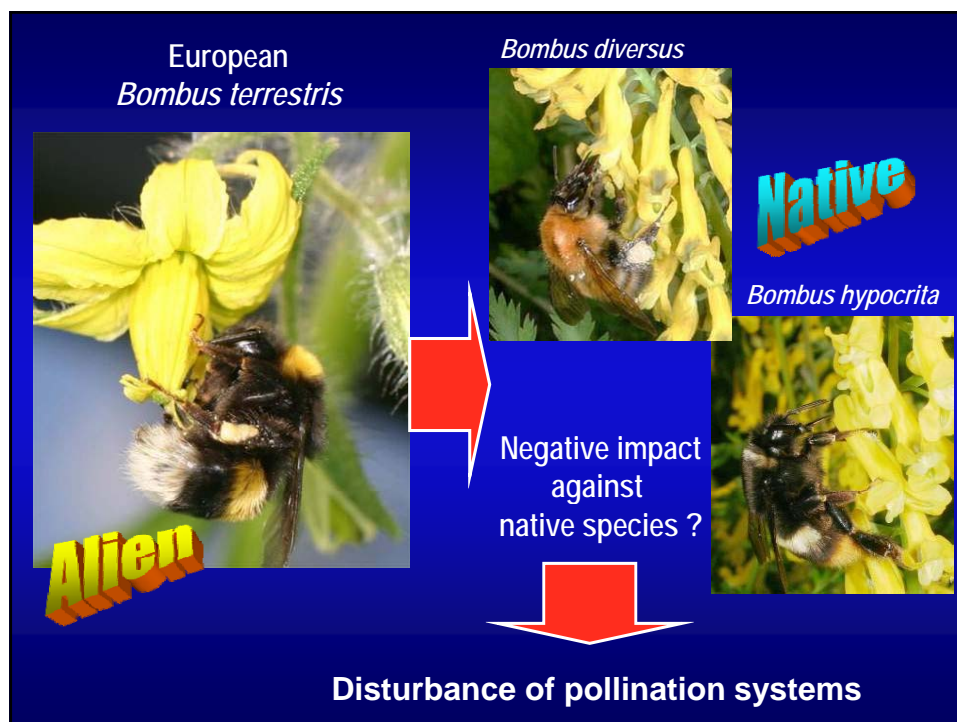
“Invasive Alien Species Act”

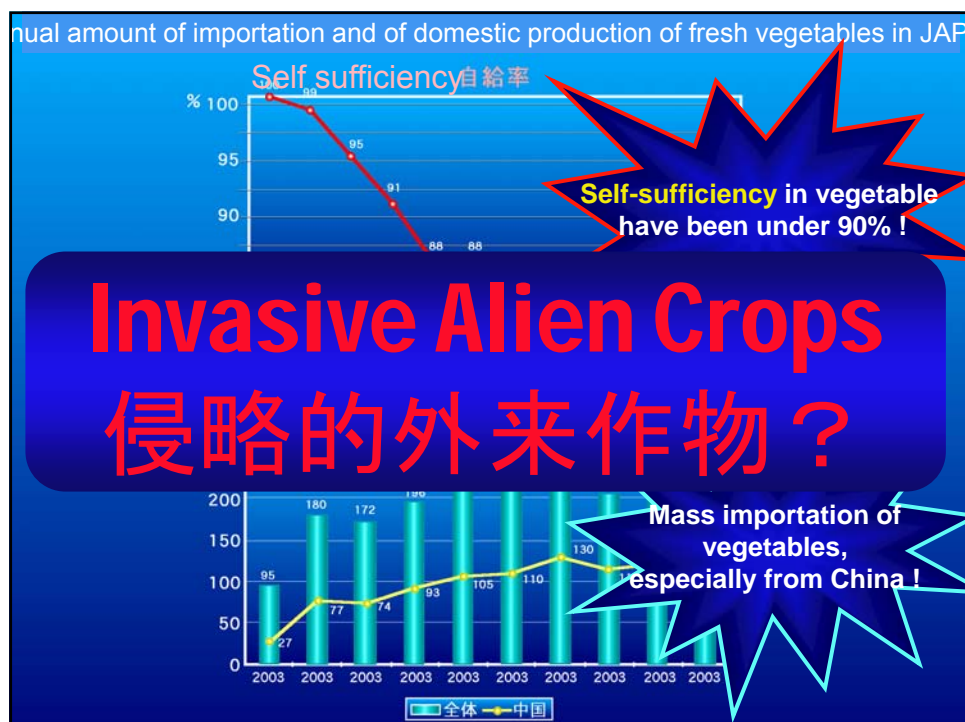
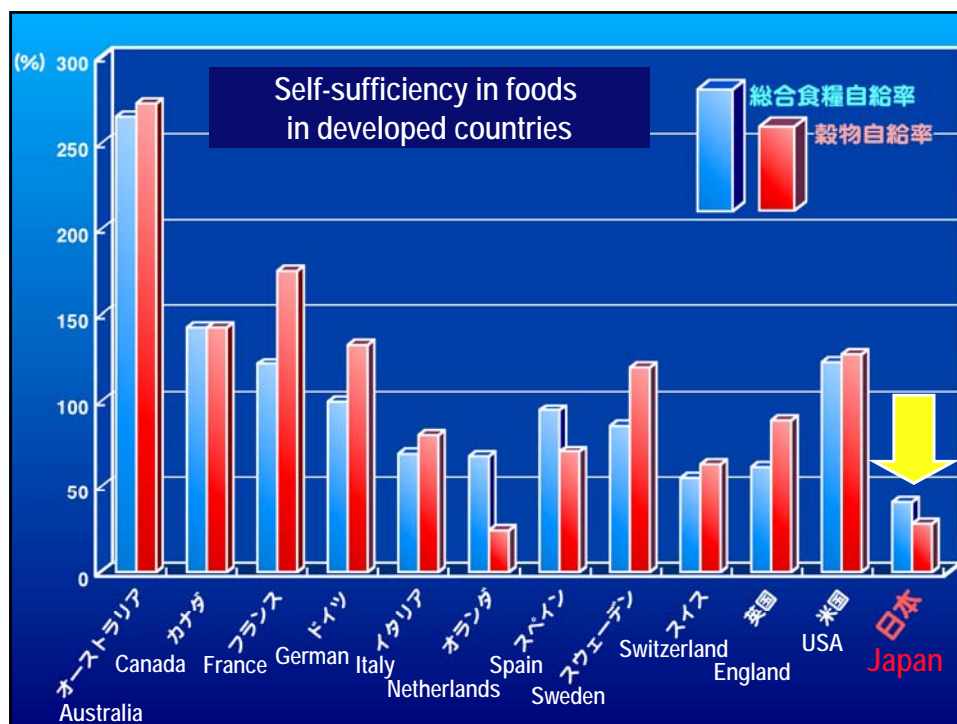


Judgment of ecological risks of I.A.S.

- 1) Predation against native species
- 2) Competition with native species
- 3) Destruction of native flora
- 4) Genetic introgression into native species







Reinforcement of food self-sufficiency

1) Reducing costs

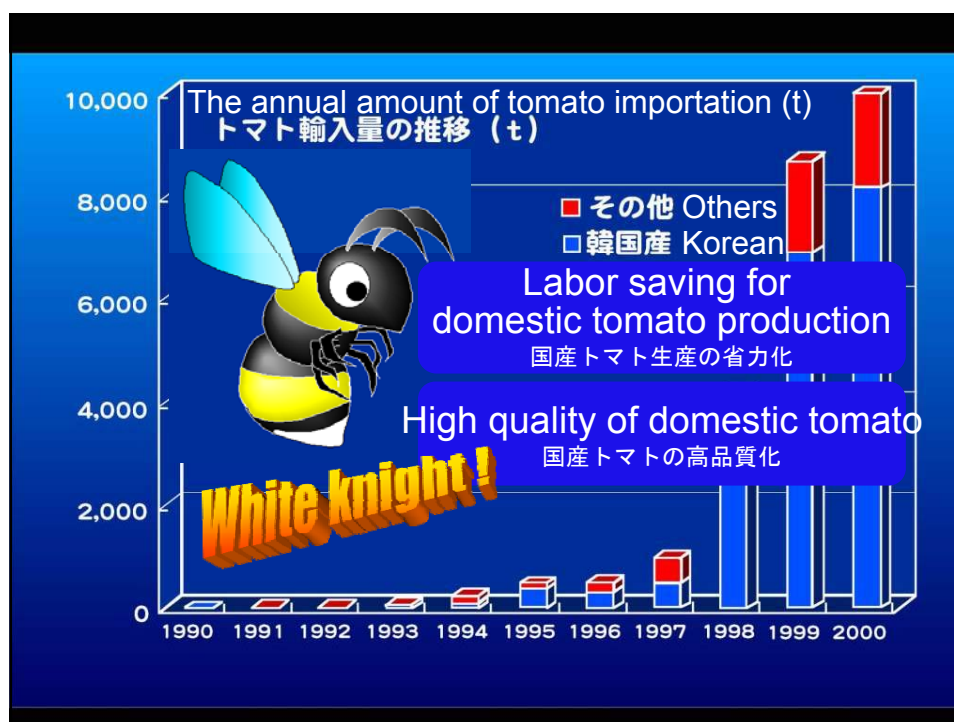
Labor saving and simplifying of agricultural work for saving of labor costs

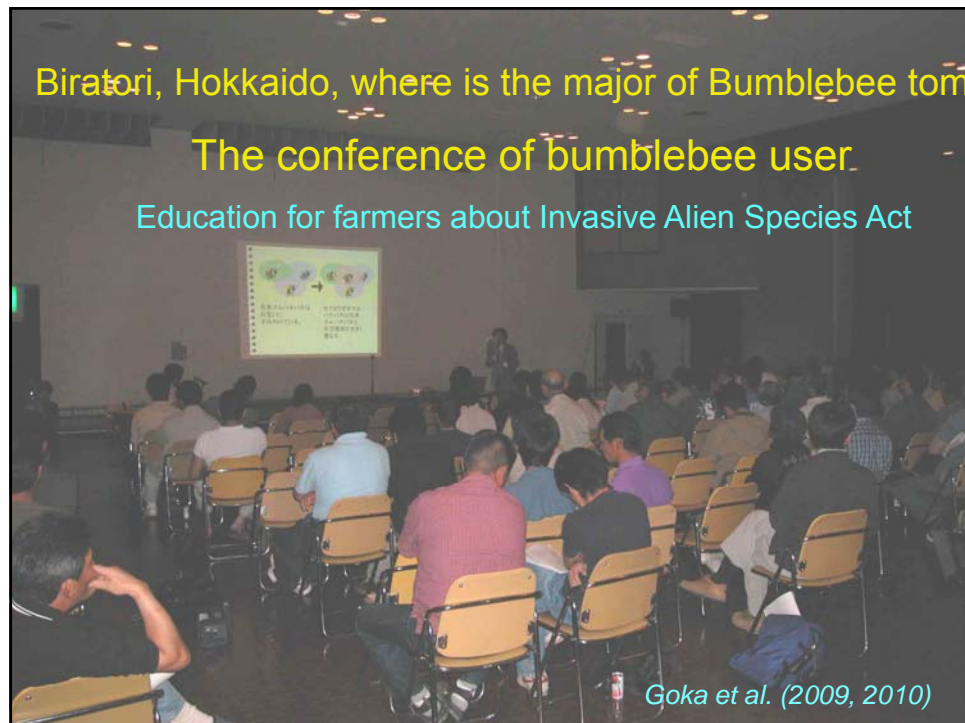
2) Specialty

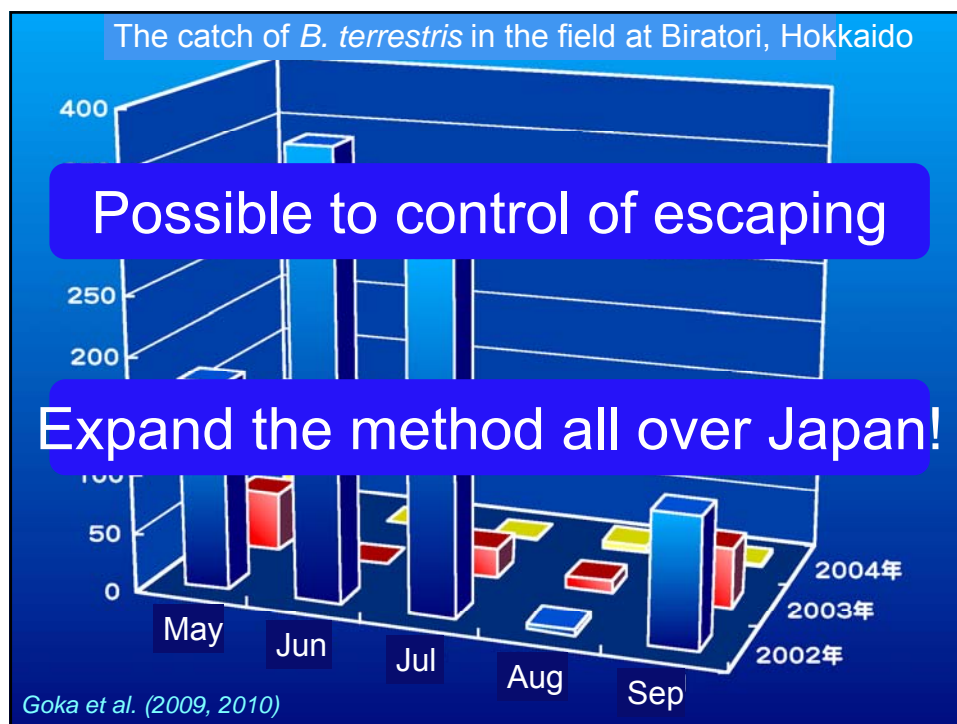
Organically grown vegetables Fully ripe vegetables
High-quality and high-added value

3) Increase the productivity

Financial assistance to farmers







生物多様性研究の盲点

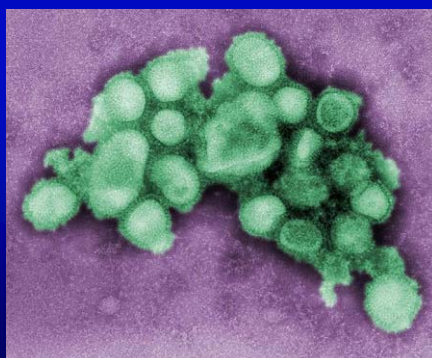
The loophole of studies for biodiversity

目に見えない生物多様性

The microorganism biodiversity

病原微生物との共生

Symbiosis with pathogens

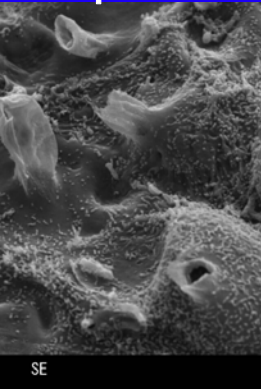
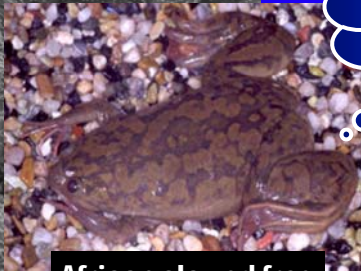


Chytridiomycosis coming to Japan!



What is the chytrid fungus?


A species of Eumycetes infecting amphibians

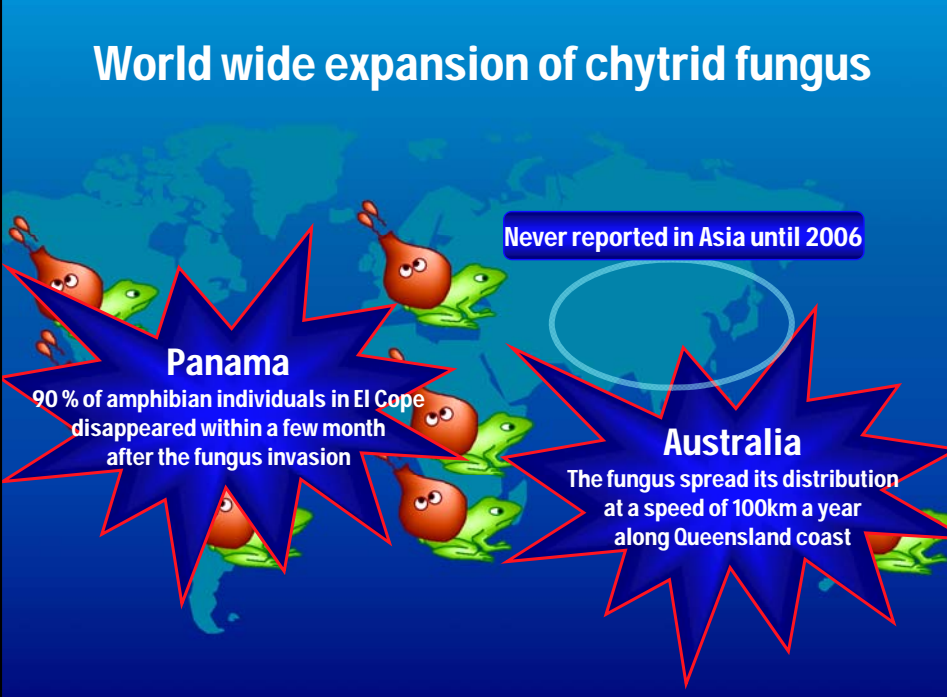
Are I the origin
of the fungus...?

African clawed frog

The infectious disease specific to amphibians caused by *Batrachomyxium dendrobatidis* which considered causative agent of recent amphibian decrease in the world



World wide expansion of chytrid fungus

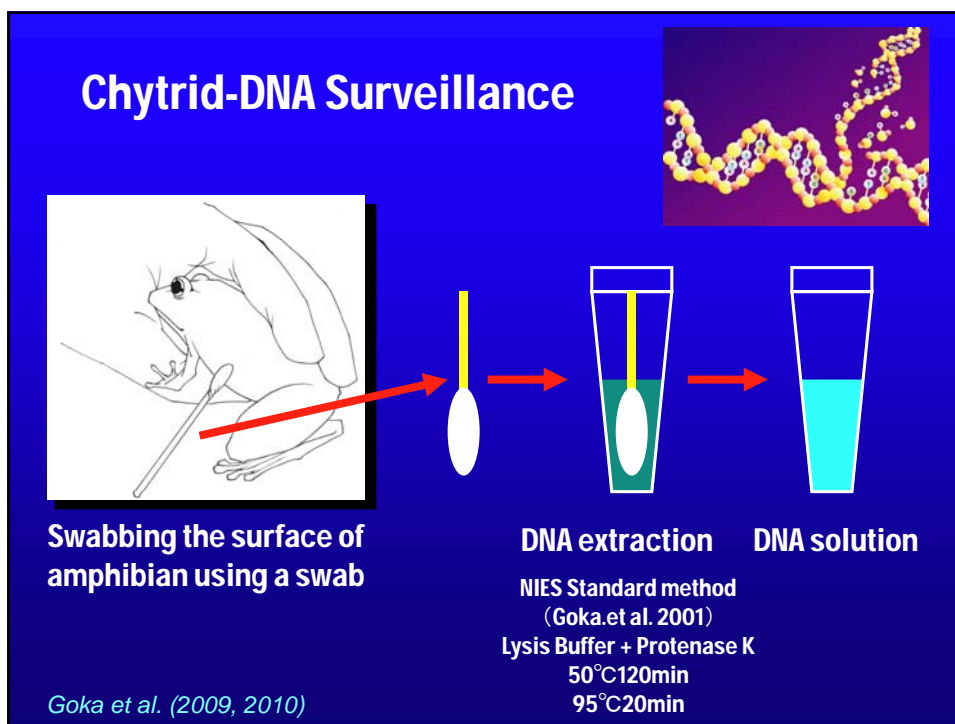
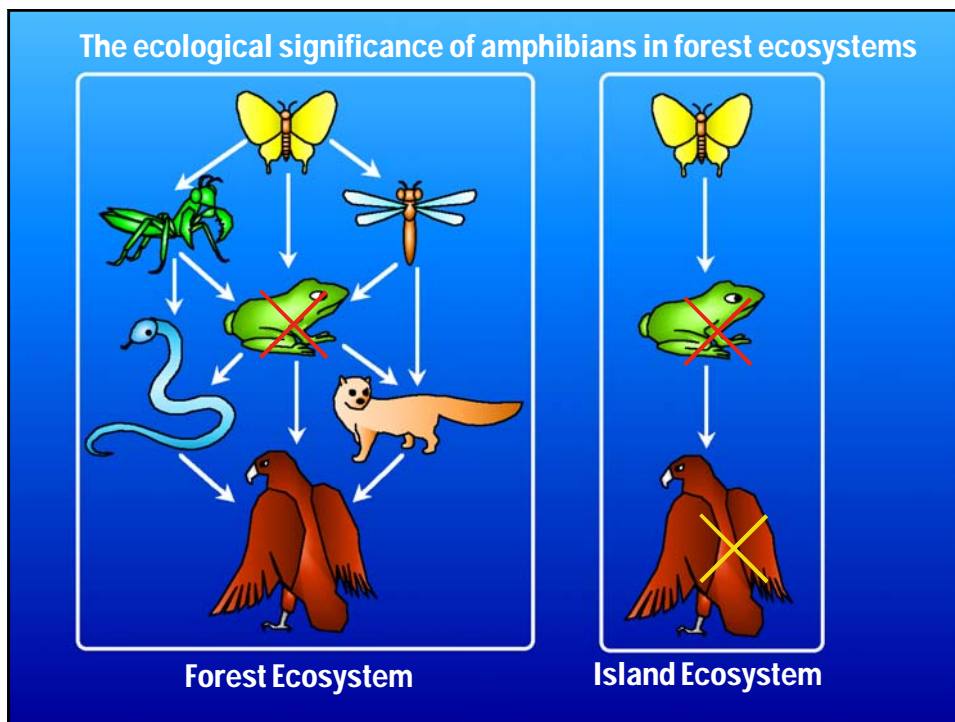


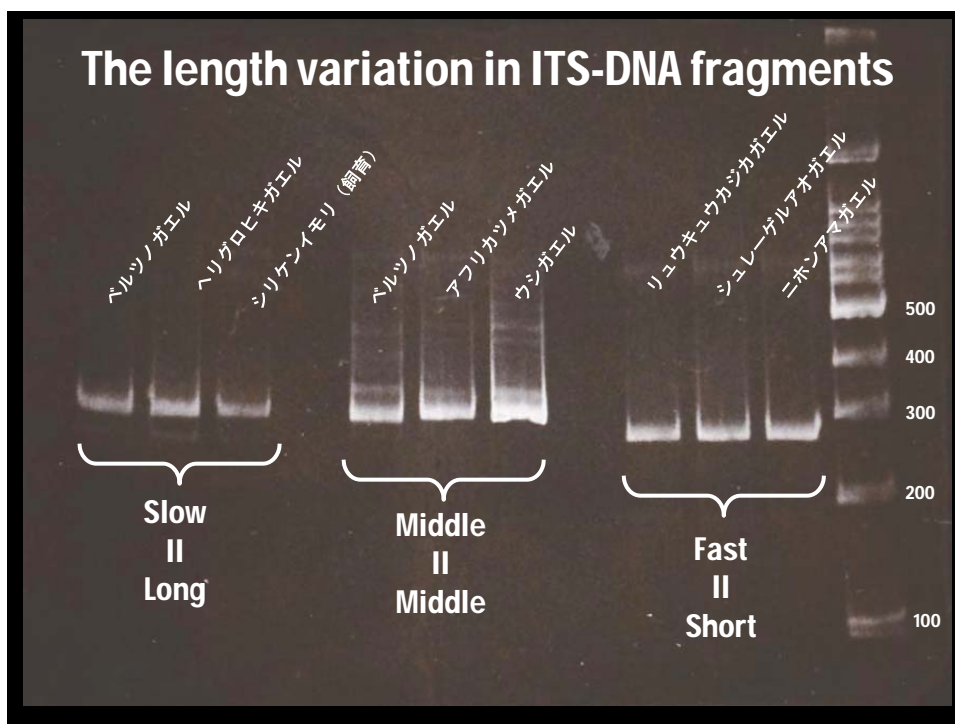
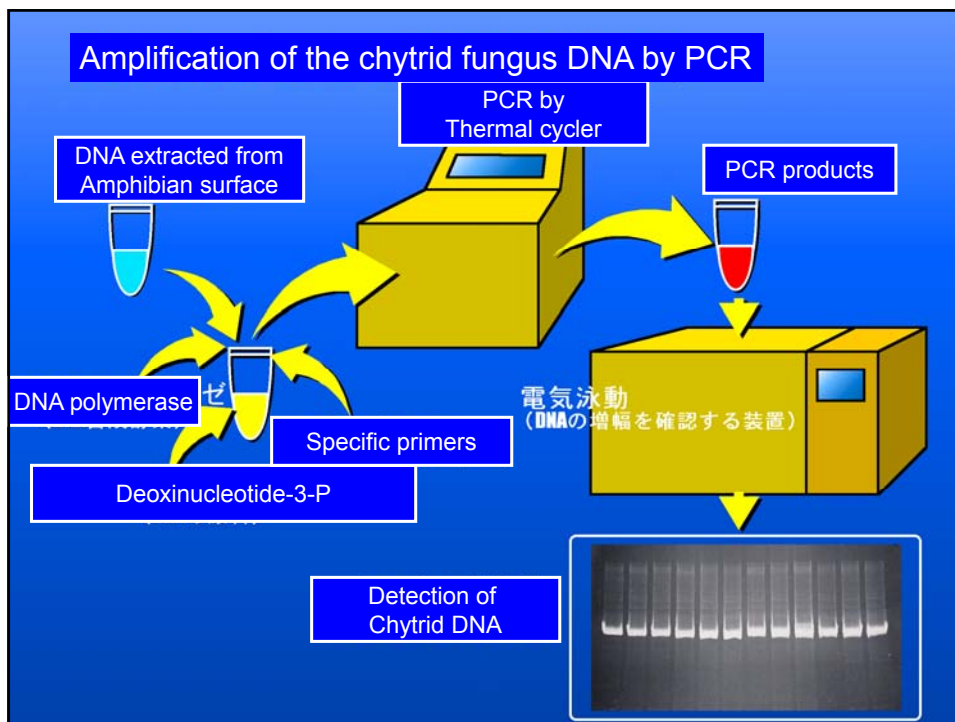
Never reported in Asia until 2006

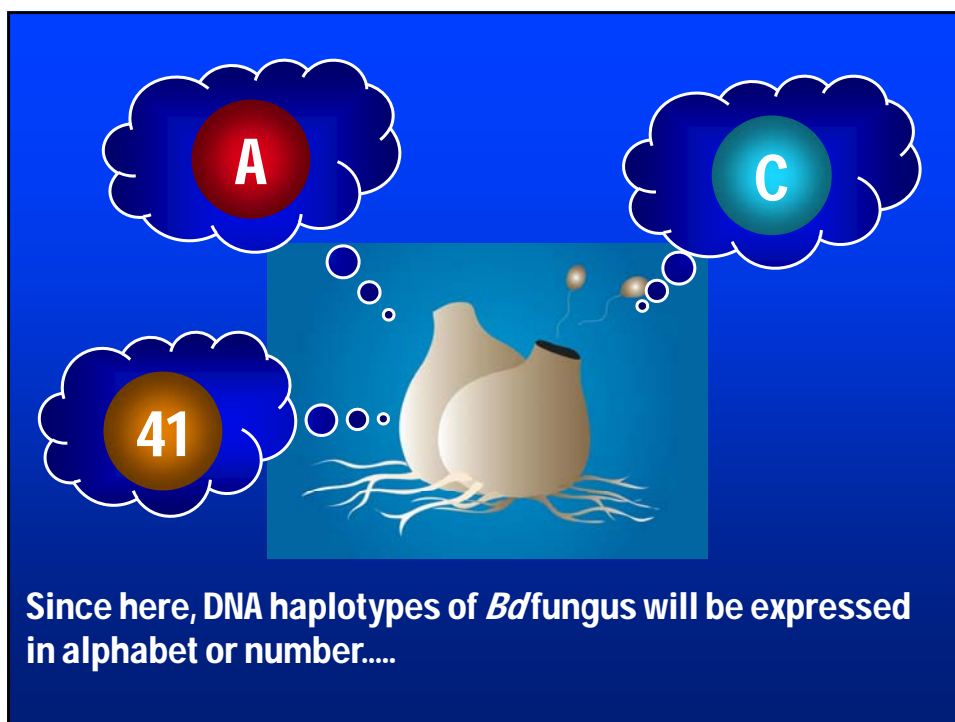
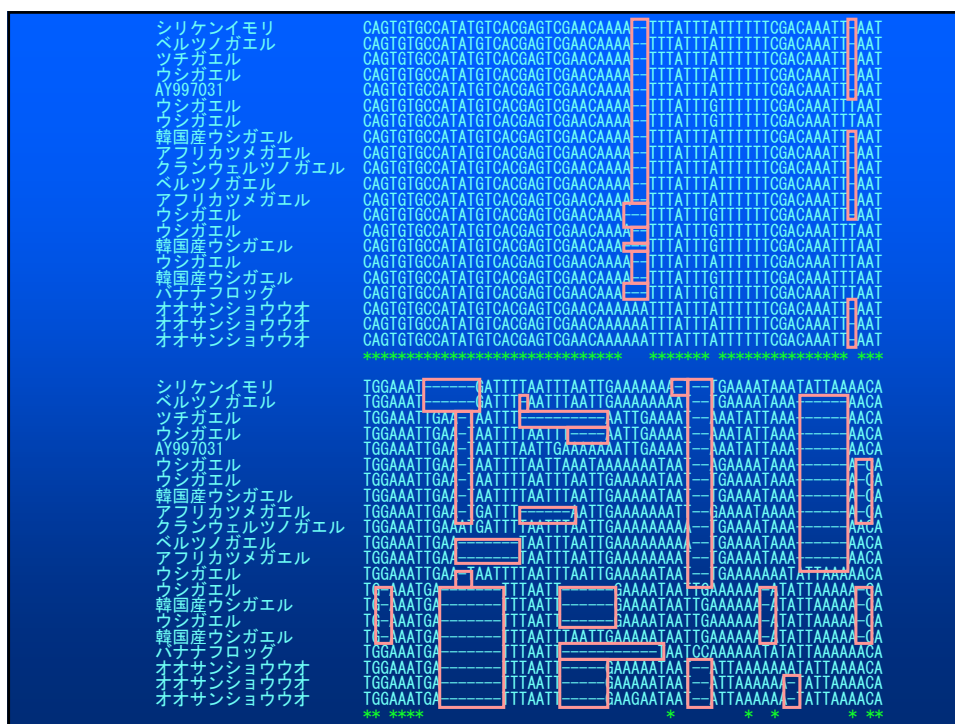
Panama
 90 % of amphibian individuals in El Cope disappeared within a few month after the fungus invasion

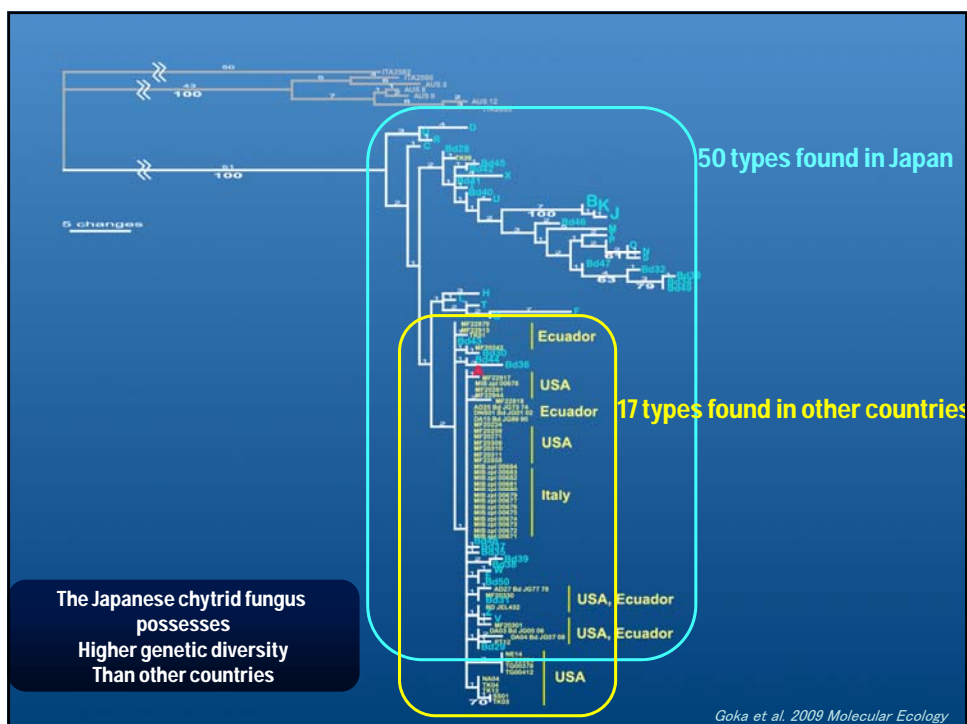
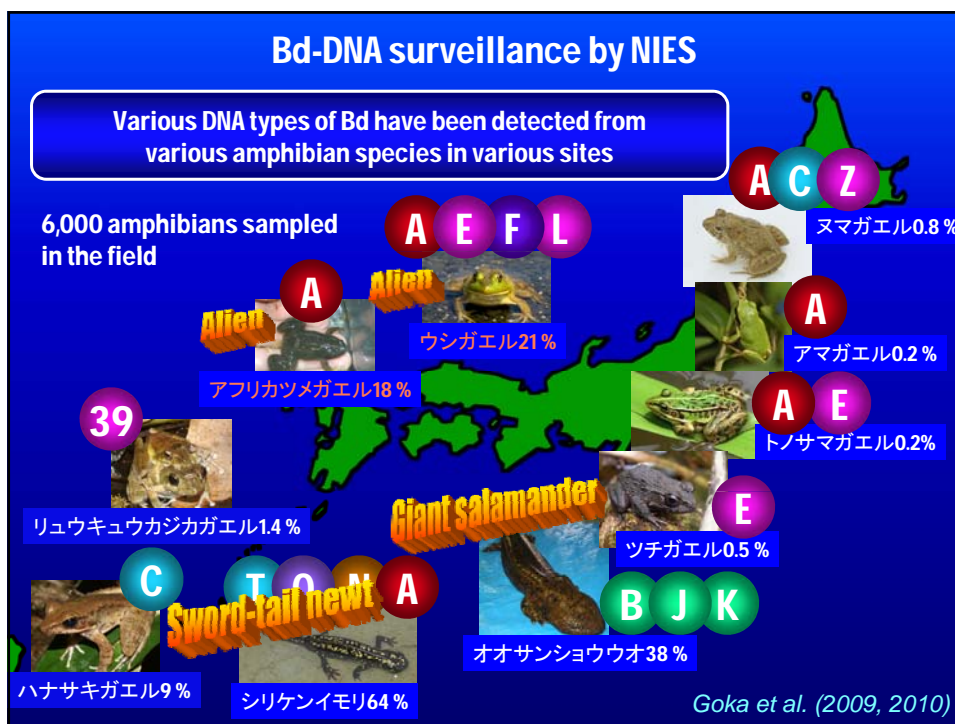
Australia
 The fungus spread its distribution at a speed of 100km a year along Queensland coast

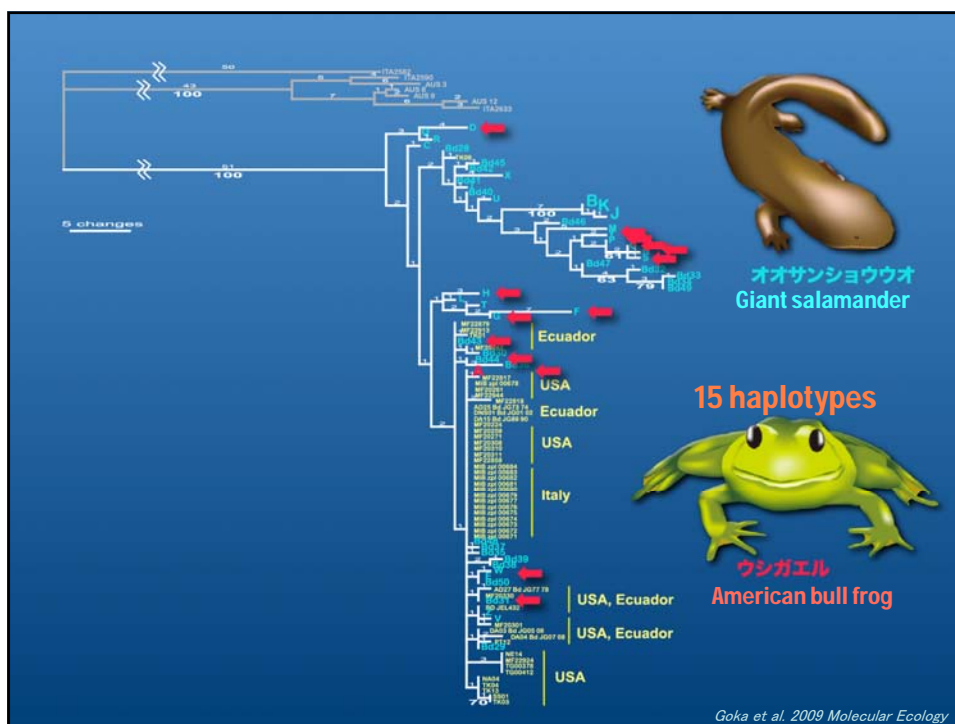
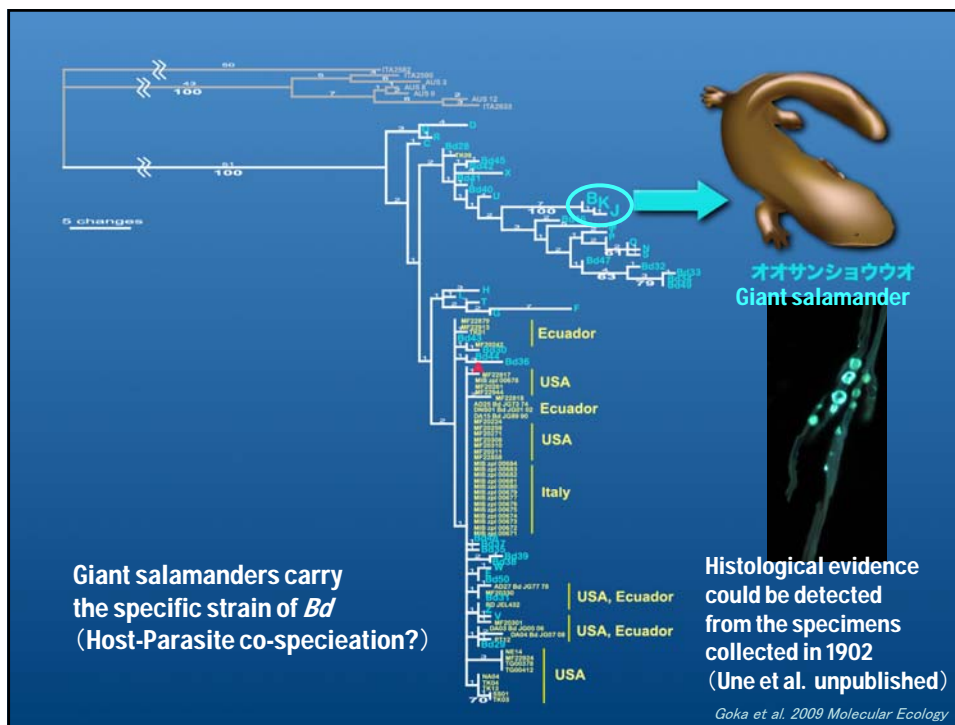


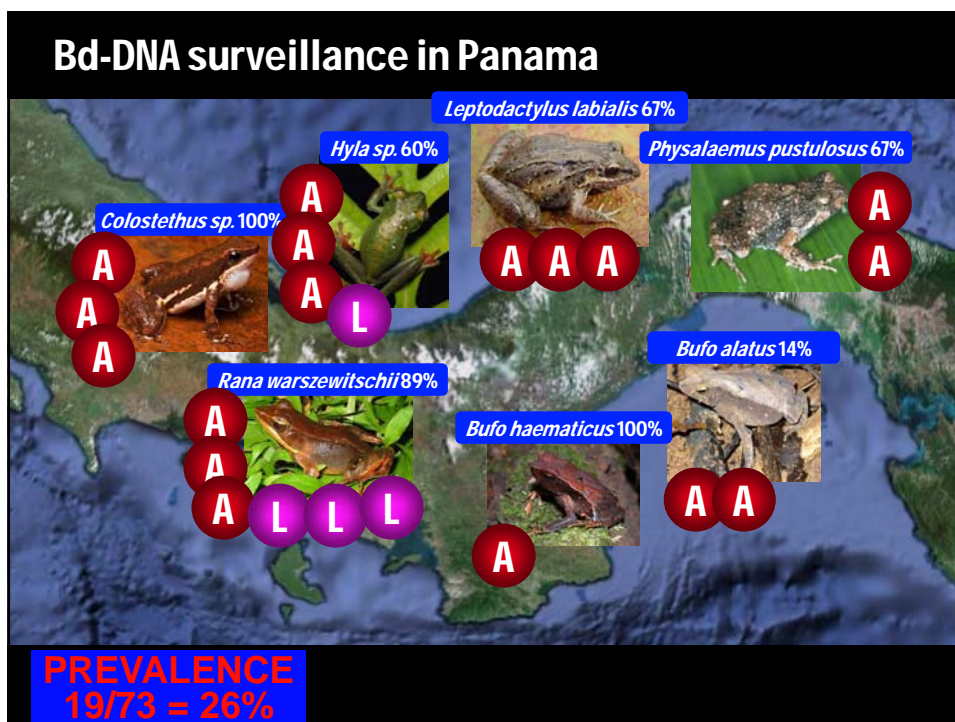
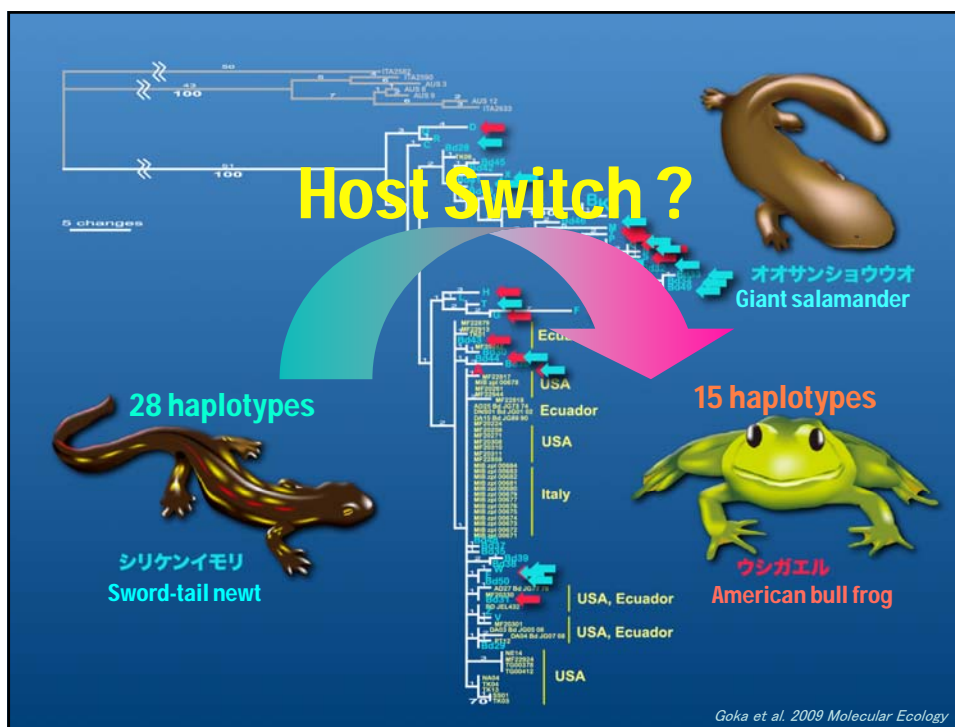


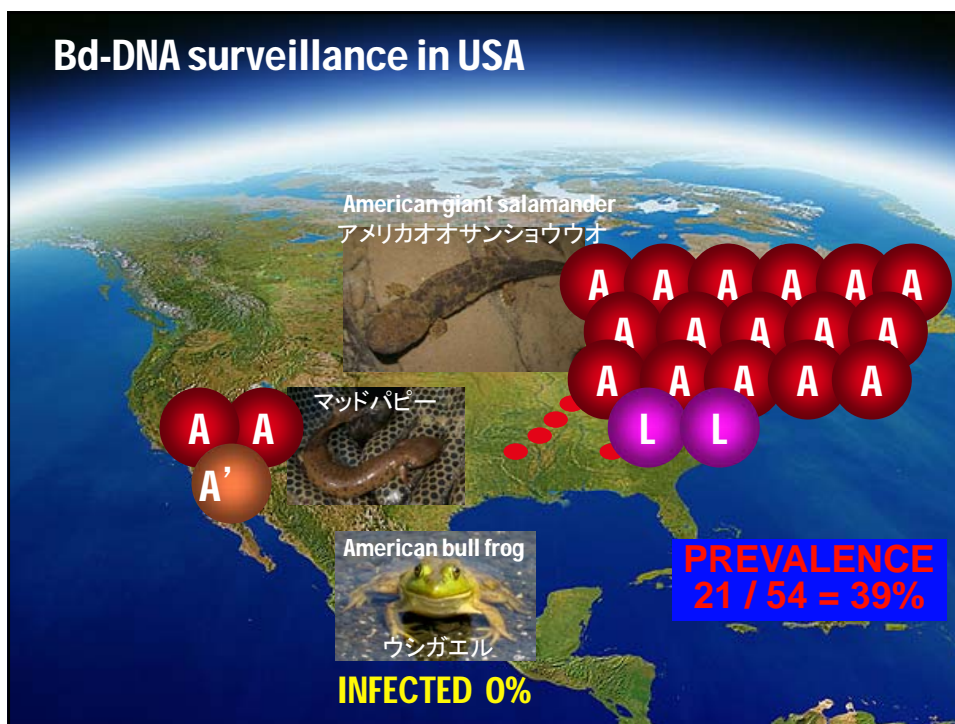
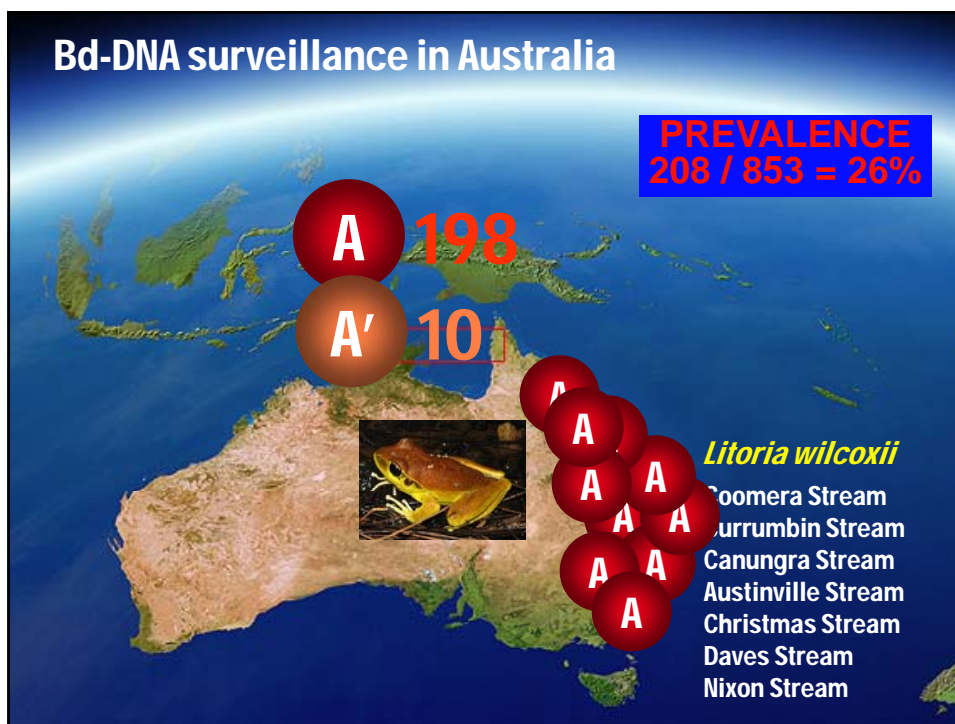


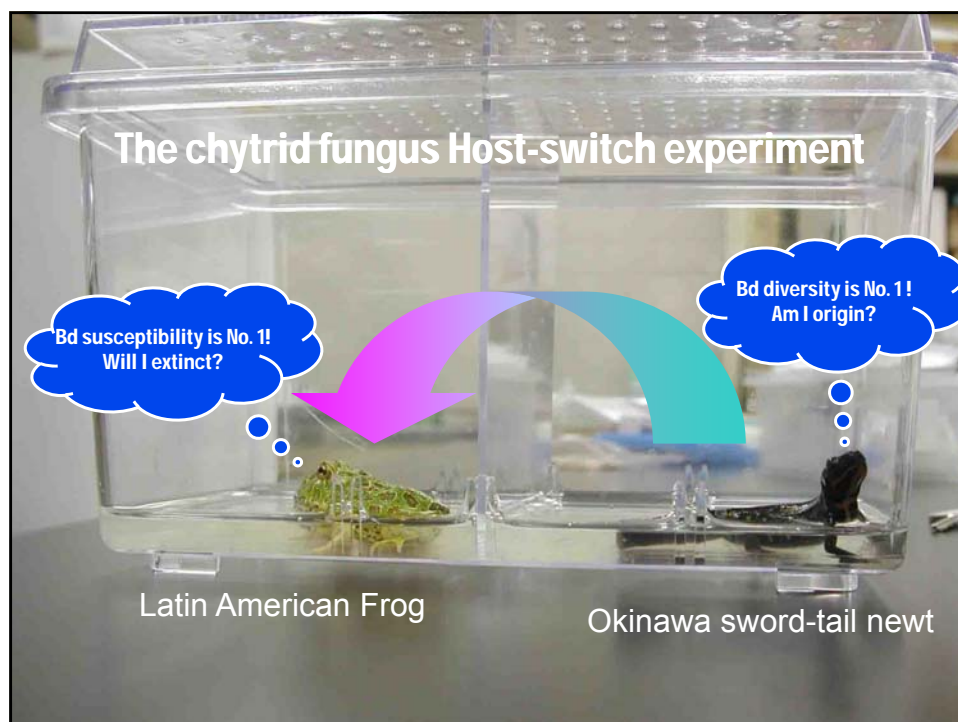
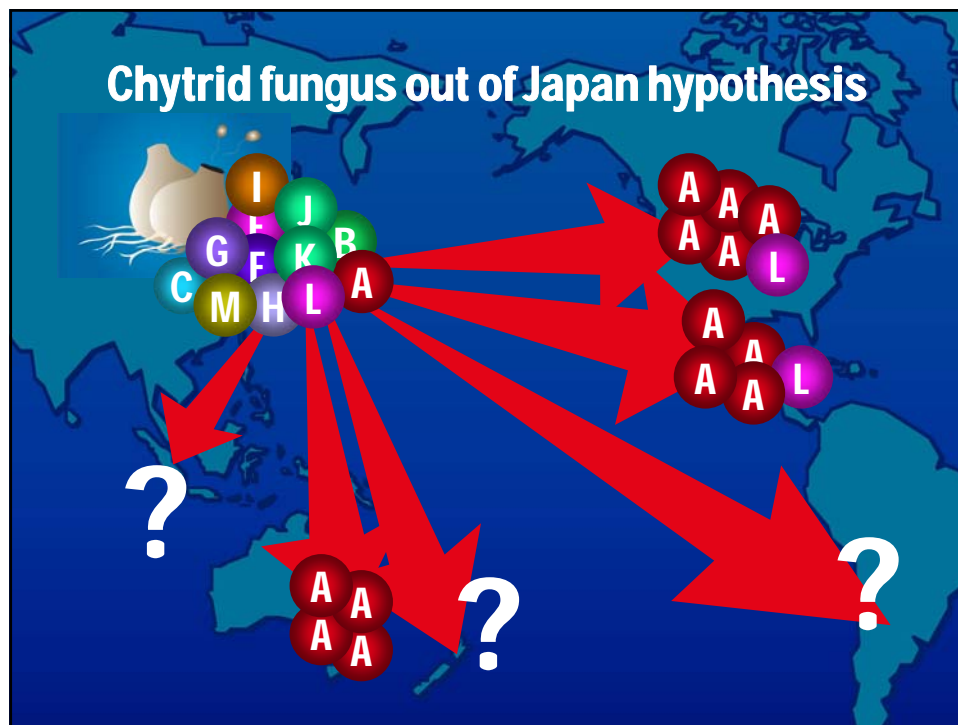


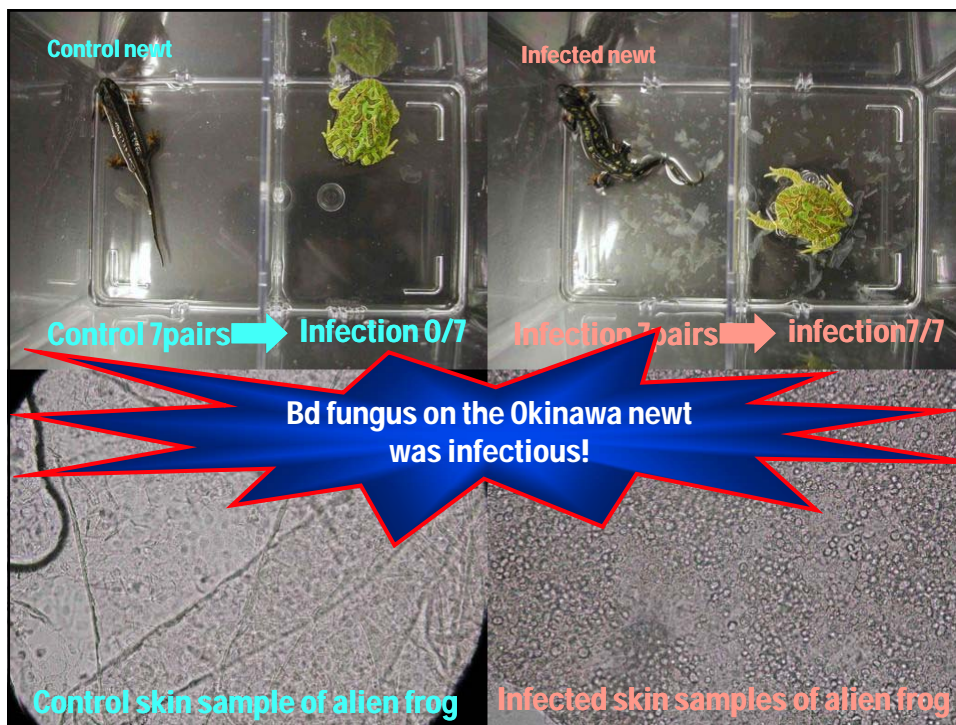




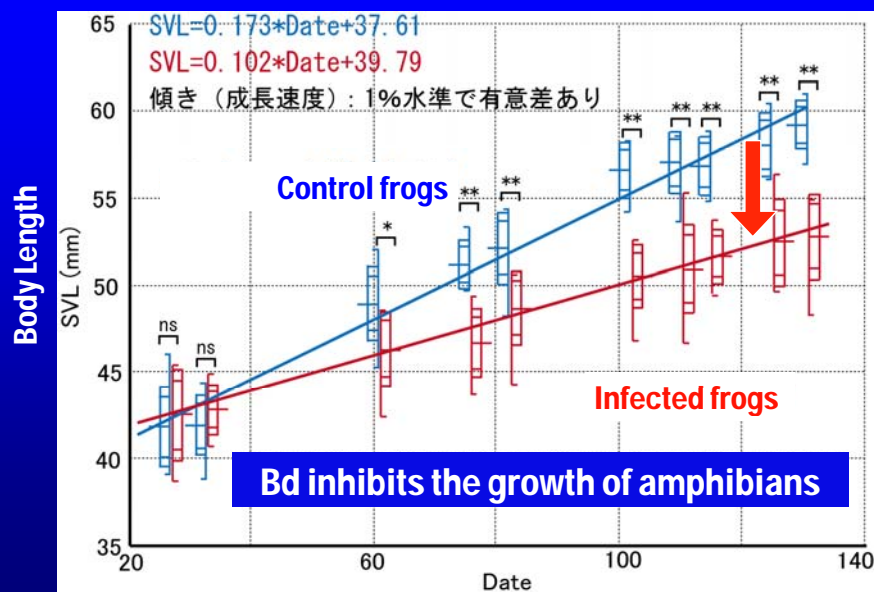








Comparison of growth rate between Control and Infected

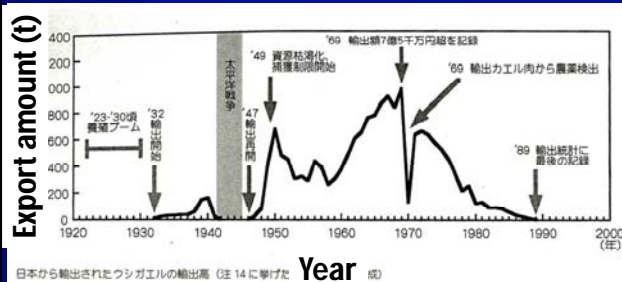


Implications from Japan Bd Surveillance

- 日本のカエルツボカビには高い多様性が存在する。
High genetic diversity in Bd in Japan
- 日本のカエルツボカビの一部には固有性がある。
Endemisms and host specificity in Bd in Japan (Giant salamander)
- 日本の両生類においてカエルツボカビ症による大量死は未確認。
No report of pandemic nor symptoms of Bd in Japan
- 感染実験でも感染するも発症は認められず(抵抗性がある?)。
Resistance against Bd in the Japanese amphibians.
- カエルツボカビの起源は日本(アジア)にある! ?
The origin of Bd came from Japan!?



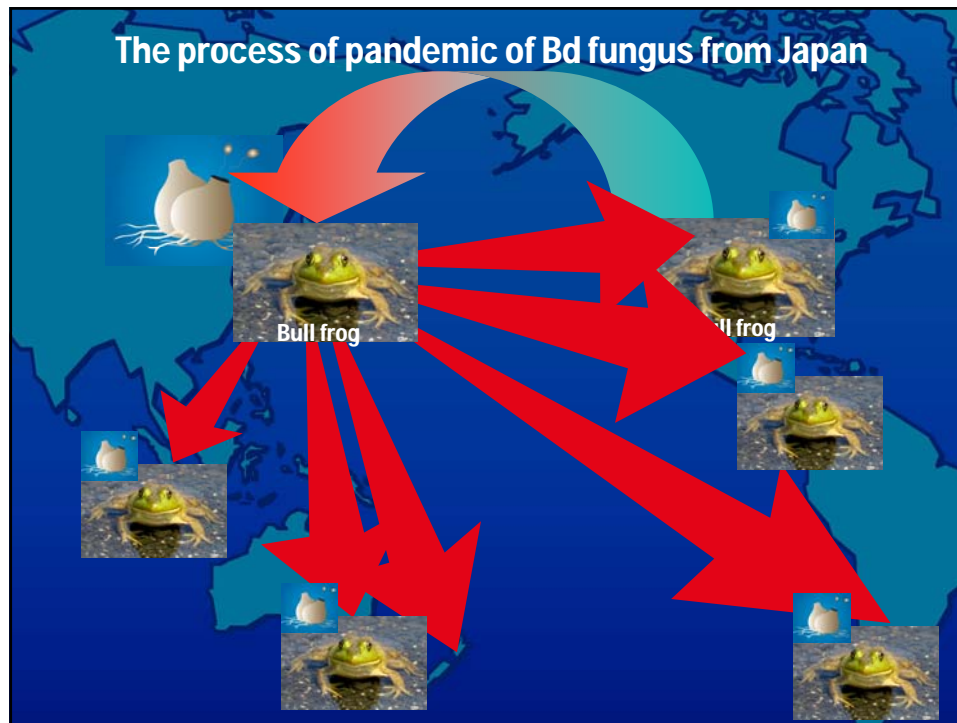
Japan was once a great bull-frog exporting country !

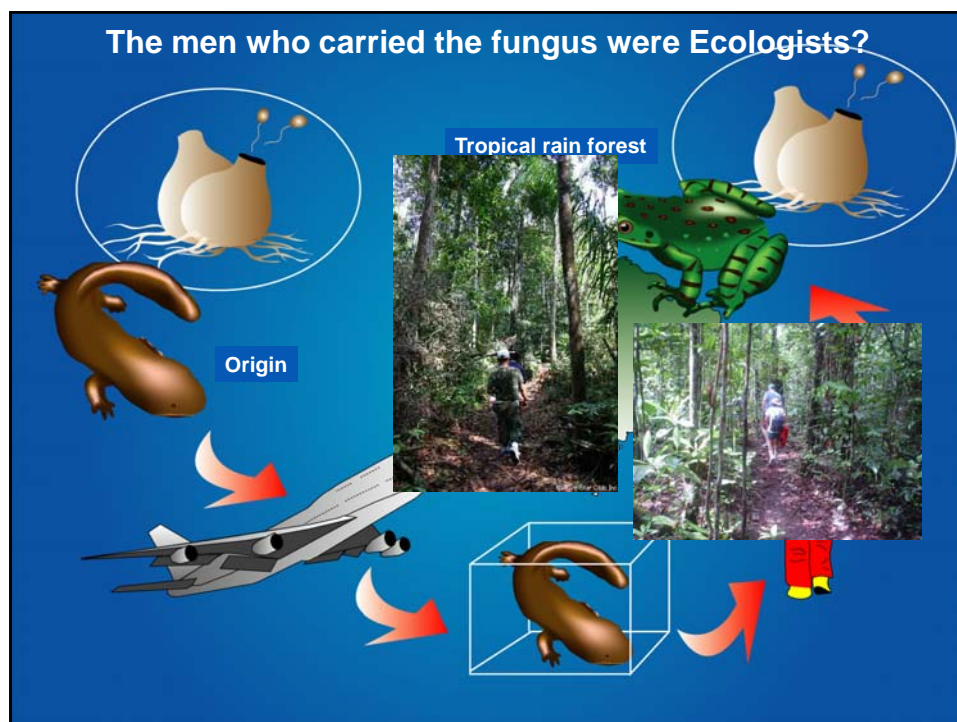


The old newsletter
for frog breeders and traders



Change "the trade for living"
to "the trade for good living"





寄生生物の多様性の危機とPandemic

The crisis of biodiversity in pathogens and pandemic as consequence

○近年の新興感染症Emerging Diseasesの感染爆発Pandemicの背景には生物多様性の崩壊がある。

The collapse of biodiversity has caused the pandemic of emerging diseases in these days

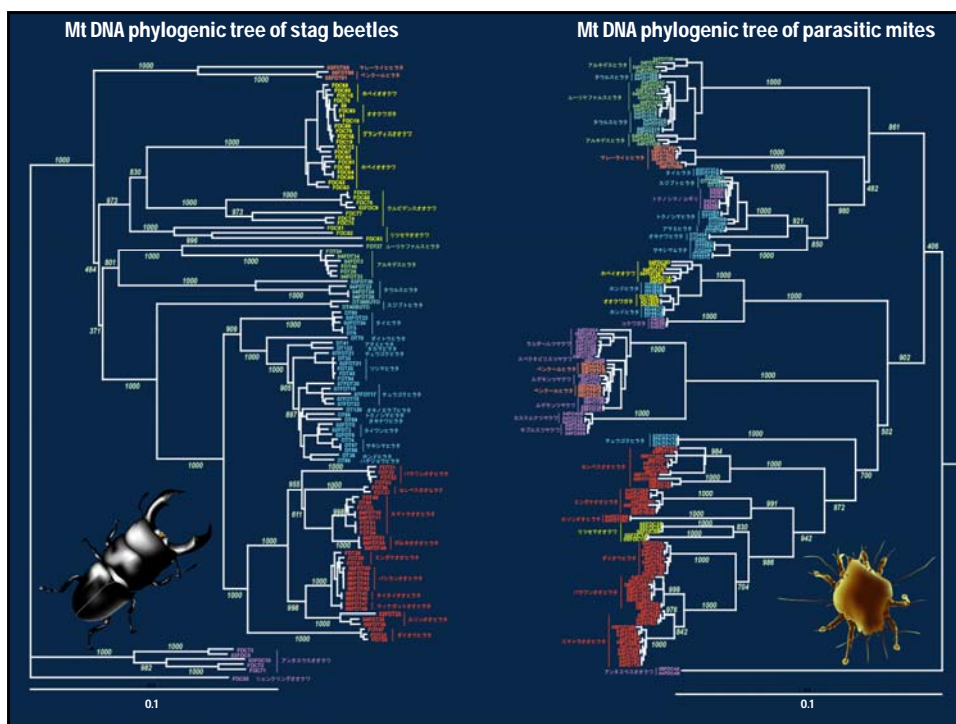
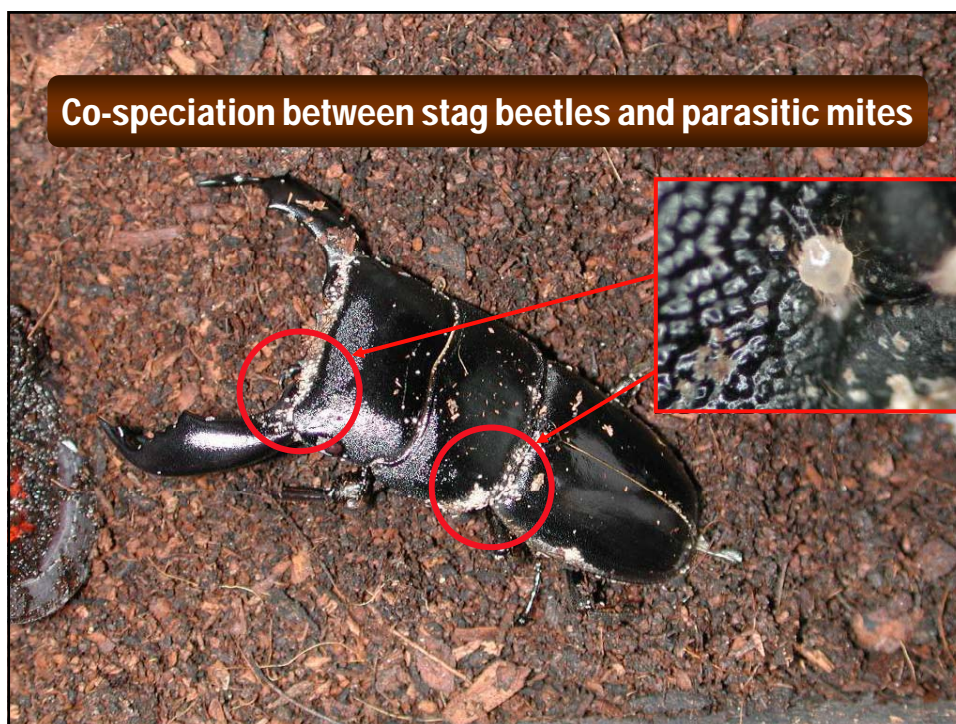
○野生生物と病原体の間には永きにわたる宿主-寄生生物共進化関係が存在する。

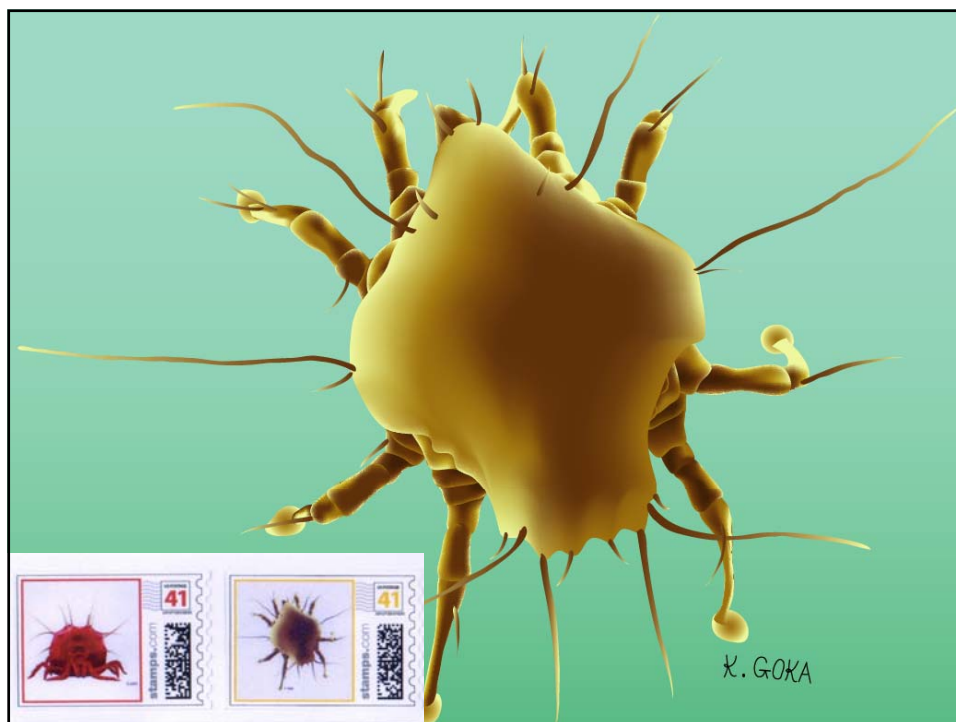
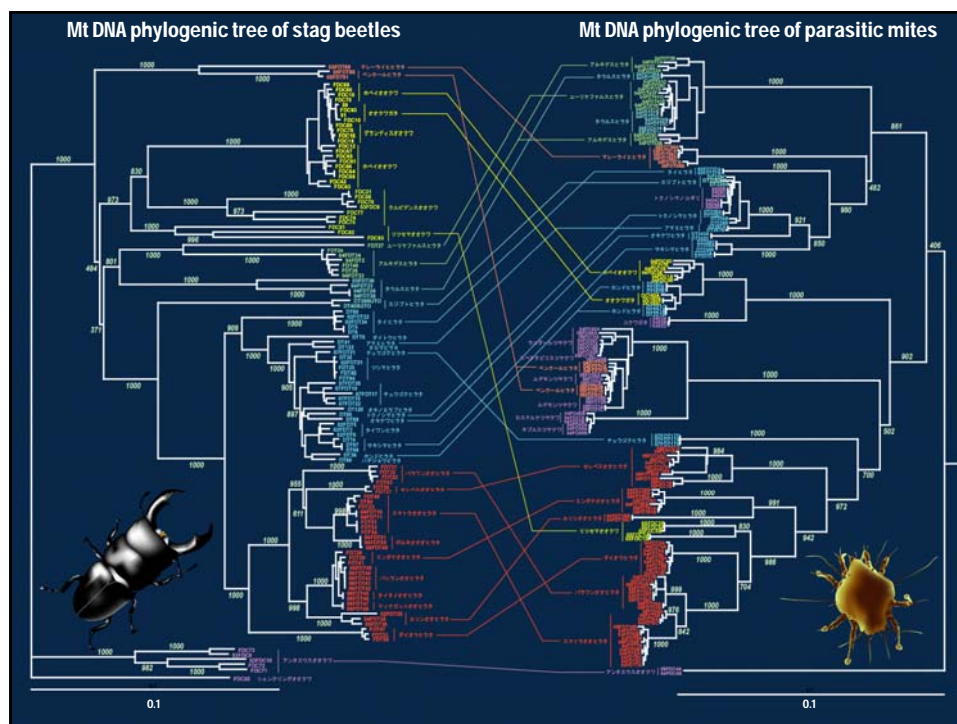
Wildlife and pathogen have constructed host-parasite relationships through a long co-evolution

○生物多様性は病原体微生物のゆりかごでもある (Daszak, 2006) Diversity is a cradle for pathogenic micro-organisms

○野生生物の生息地の破壊と生物移送が、共進化の歴史を崩壊させ、病原体微生物は新たな住処を求めて宿主転換Host switchを繰り返している。

Natural habitat destruction and transportation of wild-life have caused collapse of history of Co-evolution between host and parasite.





Co-Evolution of Host and Parasite

Co-evolution and co-adaptation between Host and Parasite

宿主-寄生生物間の共進化・共適応

Ecological base of symbiosis and immunity

共生や免疫機構の生態学的基礎

The crisis of co-speciation history of Host-Parasite
caused by human activities

生物学的侵入による宿主-寄生生物間の共種分化の歴史の崩壊

Outbreak of parasites and disease!

寄生生物と病害の感染爆発



