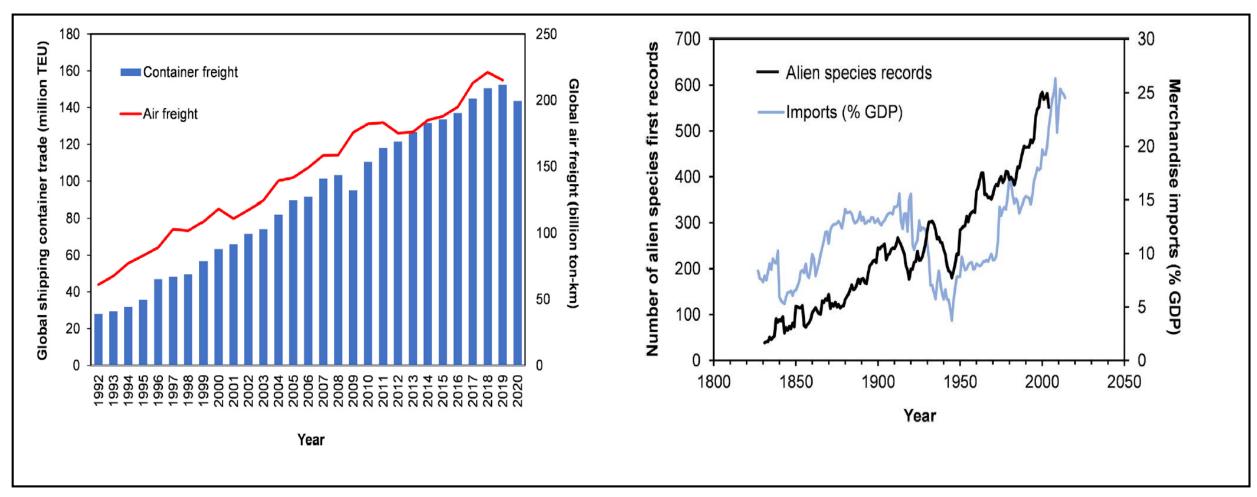
Response to the risk of unintentional introductions of invasive alien species and the needs to strengthen international and intersectoral cooperation

Fumiko Nakao, Director, Wildlife Division, Nature Conservation Bureau Ministry of the Environment Japan

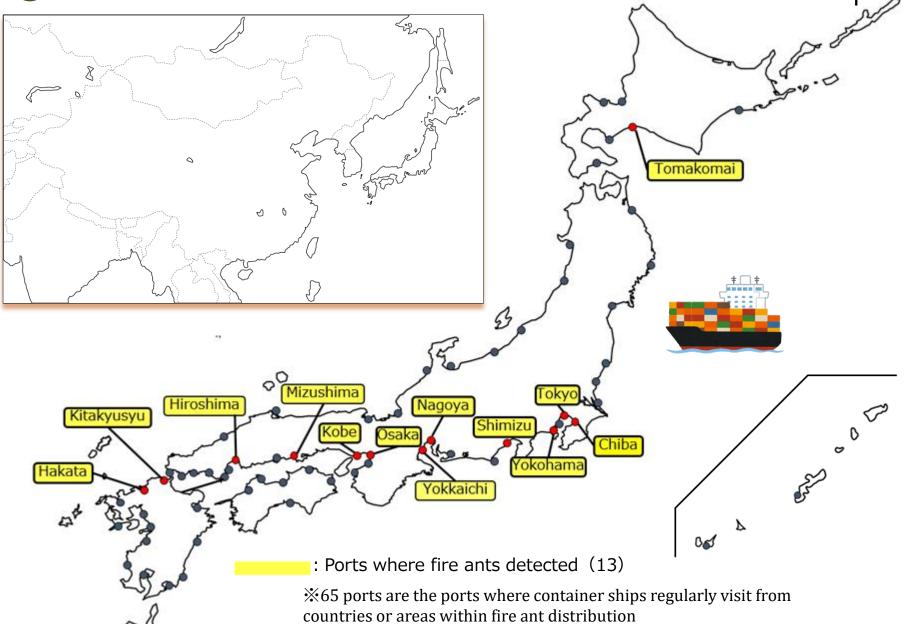
Trends of trade volumes and introductions of alien species



■ Growth in international air and sea freight

■ Global trade and invasions over time

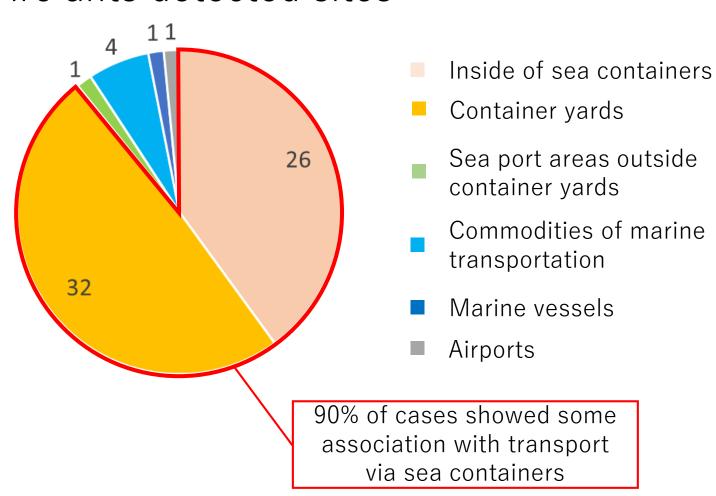
Observations of entries of fire ants at the sea ports in Japan



Detection	
FY	N Cases
2017	26
2018	12
2019	10
2020	16
2021 (As of May)	1
Total	65

Spotted fire ants entries in Japan

Fire ants detected sites



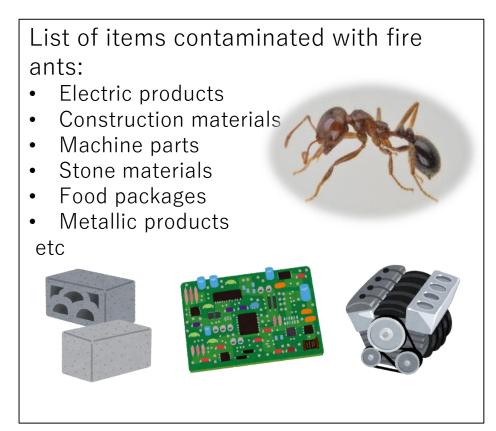








Stowaways/contaminations of fire ants in non-regulated commodities









(Fig. upper left): A sample of items in the container contaminated with fire ants.

(Fig. upper right) fire ants were found in a gap between the sea container and its bottom plate

(Fig. lower left): A colony of fire ants detected at the bottom plate of sea container.

Almost all items contaminated with fire ants are the commodities (industrial products) not subject to sanitary or phytosanitary regulations in Japan.

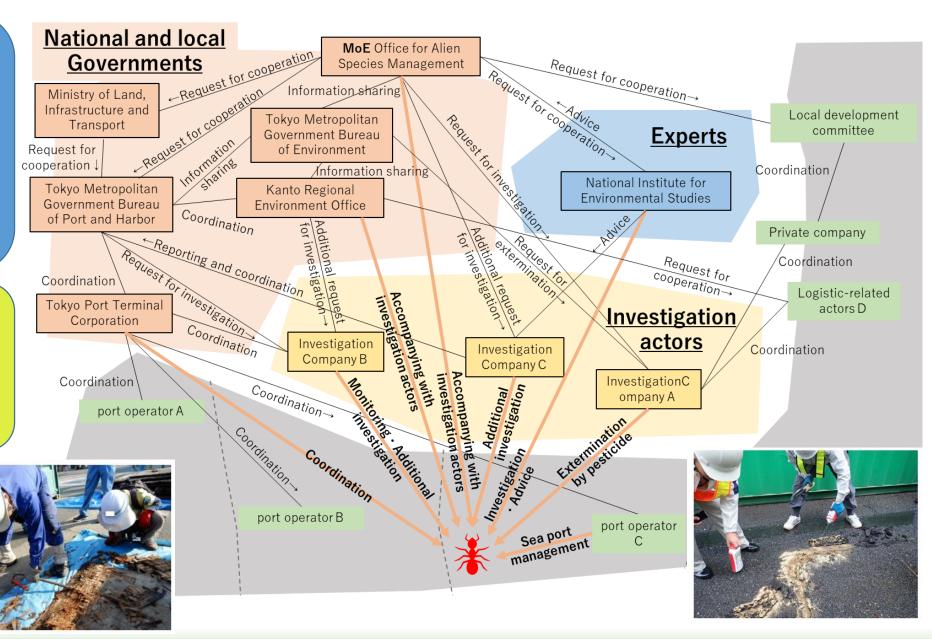
A cross-sectoral control operation against fire ants in Japan

<Ministries and Agencies>

- · M. Environment
- · A. Fire and Disaster Management
- · M. Foreign Affairs
- · M. Finance
- M. Education, Culture, Sports, Science and Technology
- · M. Health, Labour and Welfare
- M. Agriculture, Forestry and Fisheries
- M. Economy, Trade and Industry
- · M. Land, Infrastructure and Transport

<Important actors>

- Port managers
- Plant quarantine officers
- Ship and fleet operators
- In-land logistics operators
- Land owners
- Members of board of education





Increasing risk of biological invasions via sea containers Index

Maritime transportation



90 % of total trade

Predicted volume of trade



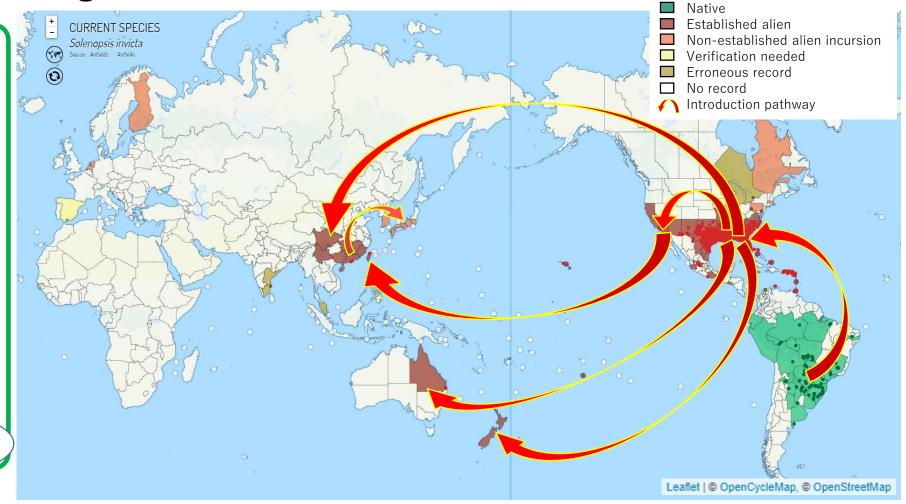
up to $12 \times \text{increase}$ by 2050

practical guidance on cleaning of sea container





Rodrigue J.-P. (2020) The Geography of Transport Systems 5th ed. DOI: 10.4324/9780429346323 Routledge, London. 480 pp Sardain, A., Sardain, E., Leung, B. (2019) Global forecasts of shipping traffic and biological invasions to 2050. Nature Sustainability 2: 274-282. DOI: 10.1038/s41893-019-0245-y



Base map modified from antmaps.org: https://antmaps.org Guénard, B., Weiser, M., Gomez, K., Narula, N., Economo, E.P. (2017) The Global Ant Biodiversity Informatics (GABI) database: a synthesis of ant species geographic distributions. Myrmecological News 24: 83-89.

Janicki, J., Narula, N., Ziegler, M., Guénard, B., Economo, E.P. (2016) Visualizing and interacting with large-volume biodiversity data using client-server web-mapping applications: The design and implementation of antmaps.org. Ecological Informatics 32: 185-193. Marina S.A., Yang, C.C., Oakey, J., Calcaterra, L., Wu, W.J., Shih, C.J., Goudet, J., Ross, K.G., Shoemaker, D. (2011) Global invasion history of the fire ant Solenopsis invicta. Science 331: 1066-1068. DOI: 10.1126/science.1198734

Conclusive remarks

- (1) Needs international cooperation to prevent contaminants / stowaways of invasive small organisms at the first place of loading commodity.
- (2) Cleanliness of sea containers is the key of environmentally responsible transport logistics.
- (3) Guidance to strengthen international cooperation with advices on applicable technologies to avoid unintentional introduction of invasive small organisms is desired.