Current status of the Dutch elm disease in Japan

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Dutch elm disease is a destructive tree disease found worldwide. By the 1980s, this disease had destroyed around 77 million American elm trees. Thus, pathogens that cause the Dutch elm disease, namely, *Ophiostoma ulmi* and 2 subspecies of *Ophiostoma novo-ulmi* (*Ophiostoma novo-ulmi* ssp. *americana* and *Ophiostoma novo-ulmi* ssp. *novo-ulmi*), have been listed as quarantine pests in Japan. Recently, we detected *O. ulmi* and *O. novo-ulmi* ssp. *americana* in Hokkaido, Northern Japan. It was the first report of the distribution of Dutch elm disease pathogens, and the fungi were suspected to be invasive in nature. However, their distribution was restricted to a part of the Hokkaido area, and there was no critical evidence that they were an invasive species. Therefore, we tried to clarify their current distribution in the Hokkaido area. In 10 localities, *Ulmus* logs and infesting bark beetles were collected and their associated fungi were isolated. *O. ulmi* and *O. novo-ulmi* ssp. *americana* were isolated from all the samples in the 10 localities in Hokkaido and were suspected to be widely distributed in Hokkaido. They were closely associated with *Scolytus esuriens* in *Ulmus davidiana* var. *japonica* and *Ulmus laciniata*. Sequence data of *ITS*, *MAT2*, *cu*, and *col* genes from each strain suggested that both *O. ulmi* and *O. novo-ulmi* ssp. *americana* were widely distributed and were coexistent. *O. ulmi* and *O. novo-ulmi* were hybridized under the situation that both coexisted, but there were no evidence of the hybrids. Thus, *O. novo-ulmi* was suspected to be recently introduced in this area. In Sapporo City, decline in some trees of *U. davidiana* var. *japonica* was observed, and both *O. ulmi* and *O. novo-ulmi* were detected. Therefore, decline of elms in Hokkaido should be monitored.

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