**Full Account for:** Ophiostoma ulmi sensu lato

**System:** Terrestrial

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**Common name**
Schlauchpilz (German), dutch elm disease (English)

**Synonym**
*Ceratocystis ulmi*

**Similar species**
*Ceratocystis fagacearum*

**Summary**
Dutch elm disease (DED) is a wilt disease caused by a pathogenic fungus disseminated by specialised bark beetles. There have been two destructive pandemics of the disease in Europe and North America during the last century, caused by the successive introduction of two fungal pathogens: Ophiostoma ulmi and Ophiostoma novo-ulmi, the latter much more aggressive. The vector is represented by bark beetles, various different species of scolyts living on elm trees. These beetles breed under the bark of dying elm trees. The young adults fly from the DED infected pupal chambers to feed on healthy elm trees. As a consequence, spores of the fungus carried on the bodies of these beetles are deposited in healthy plant tissue. Ophiostoma ulmi sensu lato can also spread via root grafts.

**Species Description**
According to Partridge (1997), *Ophiostoma ulmi* s.l. is a complex fungus. It has four spore types: conidia produced on mycelium, conidia borne on a mycelial stalk (synnema), yeast like spores that are variable in size, and ascospores, which are produced in a black fruiting body (perithecium) which ooze through the long neck of the perithecium, and accumulate at the tip in sticky mass.

Please see PaDIL (Pests and Diseases Image Library) Species Content Page [Fungi: Dutch elm disease](http://www.padil.org/spp/4552) for high quality diagnostic and overview images.

**Notes**
*Ophiostoma ulmi* s.l. was first discovered and studied in the Netherlands by seven women researchers, hence the name Dutch elm disease (Partridge, 1997).
Lifecycle Stages

_Ophiostoma ulmi_ s.l. has three asexual phases: a yeast phase, a Sporothrix-like stage, and a Graphium stage (Anacker, 2001).

Habitat Description

Hosts: Host trees include all the Euro-American native elms as field elm (_Ulmus minor_), wych elm (_Ulmus glabra_), European white elm (_Ulmus laevis_), American elm (_Ulmus americana_), red or slippery elm (_Ulmus rubra_), rock elm (_Ulmus thomasi_), and cedar elm (_Ulmus crassifolia_). Asian elm species are generally much less susceptible than Euro-American native elms. The Chinese elm (_Ulmus parvifolia_) is occasionally infected by the disease but is much less susceptible than American elm. Vectors: _O. ulmi_ is vectored by a number of bark beetles, the efficiency of which is dependant on their body dimension. In America the main species are _Hylurgopinus rufipes_, the American elm bark beetle and _Scolytus multistriatus_, the introduced smaller European elm bark beetle, while in Europe the main vector is the large European bark beetle _Scolytus scolytus_, and _S. multistriatus_, _S. pygmaeus_ and _S. kirschii_ are also active (see also Webber, 2000).

General Impacts

Stack _et al._ (1996) notes that the observable symptoms and the progression of Dutch elm disease differs among trees that are inoculated through beetle feeding and those that are infected through root grafts. Trees infected by beetles first show wilting, curling and yellowing of leaves on one or more branches in the upper portion of the tree. Large trees may survive and show progressively more symptoms for one or more years. In addition, because of their position, the infections arising from native elm bark beetle inoculations have a head start in spreading through the tree. Frequently, by the time first symptoms are noted, the fungus has already reached scaffold branches or the main trunk of the tree. Once the fungus is established within a tree, it spreads rapidly via the water-conducting vessels. The tree forms gums within these vessels in response to the presence of the fungus, causing the tree to wilt and eventually die. Trees infected through root grafts wilt and die rapidly; this frequently occurs in the spring soon after the trees have leafed out and progresses from the base of the tree upward.

Management Info

Preventative measures: According to Stack _et al._ (1996), Dutch elm disease cannot be eliminated once it begins. A year-round community sanitation program is the key to slowing the spread of the disease. The most available control is removing infected trees and promptly destroying the wood. If infected wood is to be used as firewood, it should first be debarked. Trenching to disrupt root grafts is also recommended to protect healthy elm trees near diseased ones. In urban situations, insecticide spraying of high value trees has been effective in keeping bark beetles from attacking susceptible trees. In ornamental plantings, suggested control measures include planting trees further apart to prevent root grafts or choosing mixed tree species. The use of resistant selections for new plantations is strongly recommended.

The American Phytopathological Society (APS) offers on its website illustrated lessons to introduce the symptoms and signs, pathogen biology, disease cycle, epidemiology, disease management, and scientific, economic and social significance of major plant diseases. Please follow this link [Dutch elm disease](http://www.iucngisd.org/gisd/species.php?sc=130) for details.
Pathway
Spores of the Dutch elm disease fungus are carried on the bodies of beetles and deposited in egg galleries and tree wounds (Stack et al., 1996).


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Review: Dr. Alberto Santini Forest Pathologist PhD Istituto per la Protezione delle Piante. Italy.

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ALIEN RANGE
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BIBLIOGRAPHY
10 references found for Ophiostoma ulmi sensu lato

Management information
D’Arcy, C.J., 2000. Dutch elm disease. The Plant Health Instructor. DOI: 10.1094/PHI-I-2000-0721-02 Revised, 2005. Summary: The American Phytopathological Society (APS) offers on its website illustrated lessons to introduce the symptoms and signs, pathogen biology, disease cycle, epidemiology, disease management, and scientific, economic and social significance of major plant diseases. The website will also offer basic information on the history, biology, survival, dissemination, host-parasite interactions, epidemiology and management of the major groups of plant pathogens. This section is in development.


General information


Summary: A detailed report on the order Microascales and the species it includes. Ophiostoma ulmi is among these species. The report has background information on O. ulmi and photos.


Summary: A report that includes the European countries that are affected by Dutch Elm disease.

Masuya, H; C. Brasier; Y. Ichihara; T. Kubono and N. Kanzaki. 2009. First report of the Dutch elm disease pathogens Ophiostoma ulmi and O. novo-ulmi in Japan. BSPP New Disease Reports


Summary: A report on Dutch Elm Disease in Missouri and throughout the U.S.


Summary: A website that contains information on Dutch elm disease. It includes helpful links and illustrations.


Summary: A short summary on the spread of Dutch elm disease to Canada.