

DIAGNOSIS OF FUNGAL DISEASES IMPLIED IN GRAPEVINE TRUNK DISEASE IN ALSACE VINEYARD

The French vineyard presents three principal wood diseases : eutypa dieback, esca disease and black dead arm. *Phaeomoniella chlamydospora*, *Phaeocremonium aleophilum*, *Eutypa lata*, *Fomitiporia mediterranea*, *Botryosphaeria obtusa*, *Botryosphaeria stevensii*, *Neofusicoccum parvum* are the main fungi isolated in France and associated with grapevine trunk diseases. The aim of this study is to highlight the type of wood lesions and the fungus present in the Alsace vineyard. Therefore, we have studied two vineyards planted with two different grapevine varieties (Auxerrois and Gewurztraminer). The experimental plots are located in Alsace, in the east of France. The plots are planted with *Vitis vinifera* cv Gewurztraminer or cv Auxerrois.

DESCRIPTION OF THE NECROTIC WOOD IN THE TRUNK AND IN THE YOUNG WOOD

- ◆ A central area with light colored necrosis and soft texture (figure 1a) bordered by a brown zone of irregular width and of hard consistence (figure 1b) and a brown strip (figure 1c) and a radial zone of soft texture (figure 1d). Different punctuations can be found in the healthy wood (figure 1e),
- ◆ A brown central area with hard consistence (figure 2a) with punctuations in the healthy wood (figure 2b)
- ◆ A brown central area with hard consistence (figure 3a), a brown strip (figure 3b) and a sectorial zone of hard consistence (figure 3c). Different punctuations can be found in the healthy wood (3d),
- ◆ Brown necrotic areas in three years old wood (figure 4),
- ◆ A brown central area with sectorial brown fan shaped (figure 5).

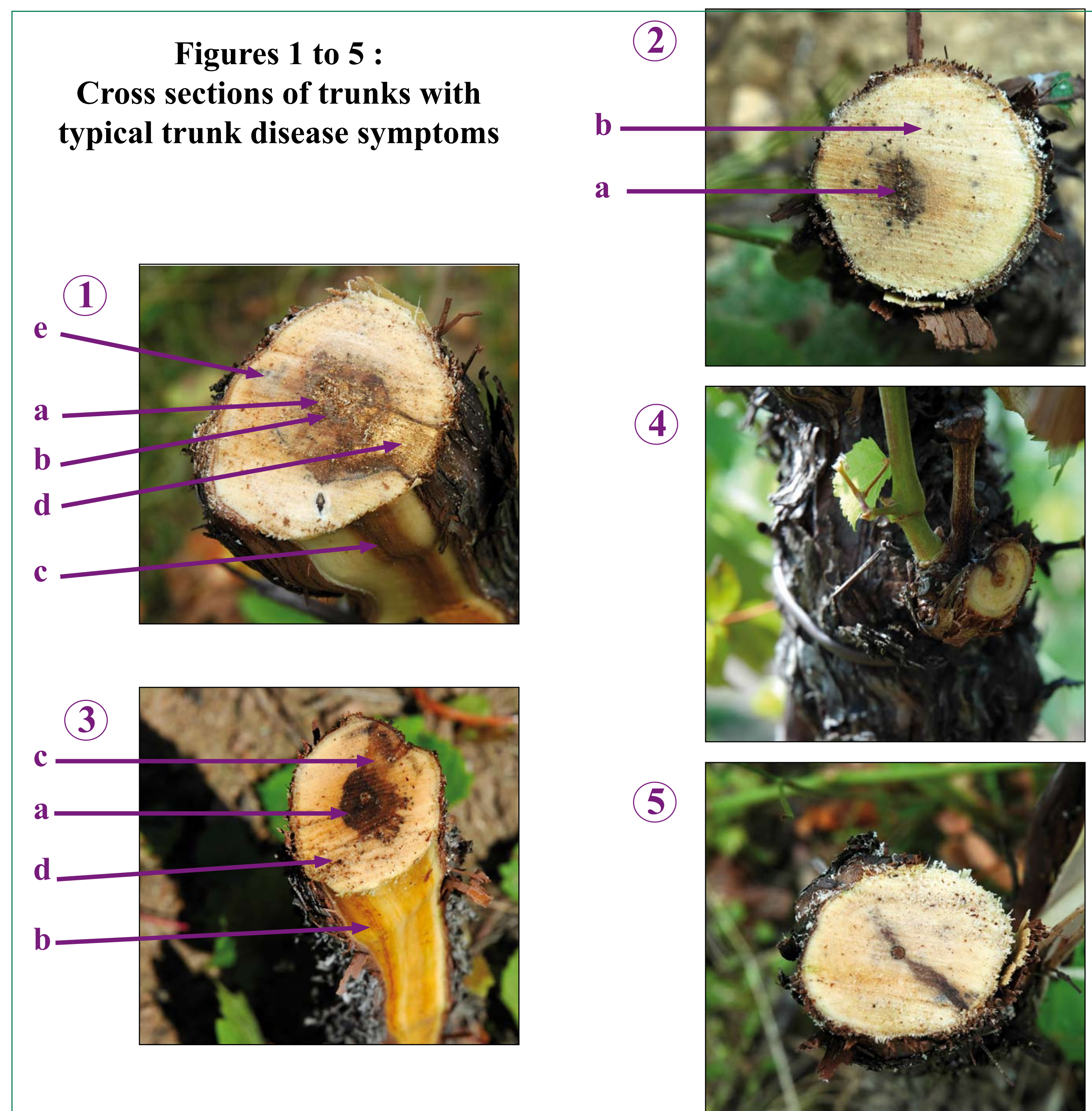


Table : Identity, frequency and couple of organisms isolated from the different cross-sections for the Auxerrois variety (black numbers, white cases) and Gewurztraminer variety (white numbers, grey cases) and combination of more that two fungi

	<i>Eutypa lata</i>	<i>Phaeocremonium aleophilum</i>	<i>Fomitiporia mediterranea</i>	<i>Phaeomoniella chlamydospora</i>	<i>Botryosphaeria</i> sp.	<i>Botryosphaeria obtusa</i>	<i>Botryosphaeria stevensii</i>	<i>Cladosporium</i> sp.	<i>Phomopsis viticola</i>	<i>Phomopsis</i> sp.	<i>Epicoccum</i> sp.	<i>Penicillium</i> sp.	<i>Pestalotia</i> sp.	<i>Trichoderma</i> sp.	<i>Fusarium</i> sp.	<i>Pullularia</i> sp.	<i>Alternaria</i> sp.	<i>Stereum hirsutum</i>	<i>Verticillium cephalosporum</i>	<i>Botrytis cinerea</i>
<i>Eutypa lata</i>	15	1	3	1																
<i>Phaeocremonium aleophilum</i>		4	5																	
<i>Fomitiporia mediterranea</i>	1		4	5																
<i>Phaeomoniella chlamydospora</i>	1	1	1	4																
<i>Botryosphaeria</i> sp.					1															
<i>Botryosphaeria obtusa</i>	1	1	1	1	1	7	2													
<i>Botryosphaeria stevensii</i>							2													
<i>Cladosporium</i> sp.								1												
<i>Phomopsis viticola</i>						1														
<i>Phomopsis</i> sp.						1														
<i>Epicoccum</i> sp.																				
<i>Penicillium</i> sp.												1	3	1						
<i>Pestalotia</i> sp.																				
<i>Trichoderma</i> sp.								1						2	7					
<i>Fusarium</i> sp.															1					
<i>Pullularia</i> sp.																2				
<i>Alternaria</i> sp.																	1			
<i>Stereum hirsutum</i>																		1		
<i>Verticillium cephalosporum</i>																			2	
<i>Botrytis cinerea</i>																				2

Auxerrois cv.

Gewurztraminer cv.

Auxerrois cv.

- Combination 1:** *Fomitiporia mediterranea* + *Epicoccum* sp. + *Penicillium* sp.
- Combination 2:** *Fomitiporia mediterranea* + *Phaeocremonium aleophilum* + *Phaeomoniella chlamydospora*
- Combination 3:** *Phaeomoniella chlamydospora* + *Epicoccum* sp.

Gewurztraminer cv.

- Combination 1:** *Phaeomoniella chlamydospora* + *Trichoderma* sp. + *Alternaria* sp + *Penicillium* sp. + *Phaeocremonium aleophilum*
- Combination 2:** *Phaeomoniella chlamydospora* + *Fusarium* sp. + *Trichoderma* sp.

RESULTS AND DISCUSSION

Different cross-sections were made on trunks, arms and roots of 62 vines showing foliar symptoms. This examination enabled us to list various fungi implied in wood diseases in Alsace. The microbiological isolations confirm the observations during the vegetative season and the association with foliar esca and black dead arm symptoms. Microbiological observations showed that the majority of these vines were infected with *B. obtusa*, *P. chlamydospora*, *E. lata*, *F. mediterranea* and *P. aleophilum*.

In the Gewurztraminer vineyard, the fungus the most frequently isolated was *P. chlamydospora*, followed by *B. obtusa*. In the Auxerrois vineyard, *E. lata* is the most frequently isolated, followed by *B. obtusa*. The mortality of the different trunks cannot directly be charged to an isolated fungus. The presence of *Botryosphaeria obtusa* in the wood of the different parts of the grapevine and in the young wood should certainly complete the action accomplished by *Eutypa lata* and *Phaeomoniella chlamydospora*.