



SVEUČILIŠTE U ZAGREBU FAKULTET ŠUMARSTVA I DRVNE TEHNOLOGIJE
UNIVERSITY OF ZAGREB FACULTY OF FORESTRY AND WOOD TECHNOLOGY

Hymenoscyphus fraxineus in glivni kompleks povezan z odmiranjem ozkolistnega jesena na Hrvaškem

Danko DIMINIĆ, Jelena KRANJEC ORLOVIĆ

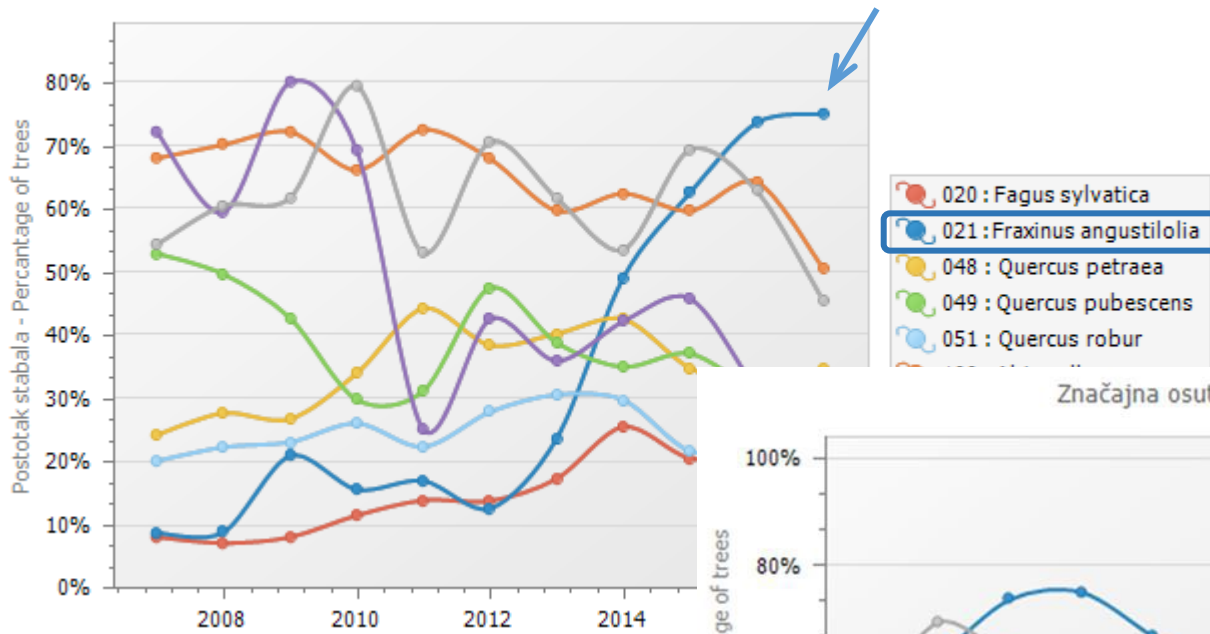
Institute of Forest Protection and Wildlife Management / Zavod za zaštitu šuma i lovno gospodarenje

15. seminar in delavnica iz varstva gozdov, Črna na Koroškem, 07.05.2025

Pomembna osutost krošenj gozdnega drevja na Hrvaškem v obdobju 2007-2021

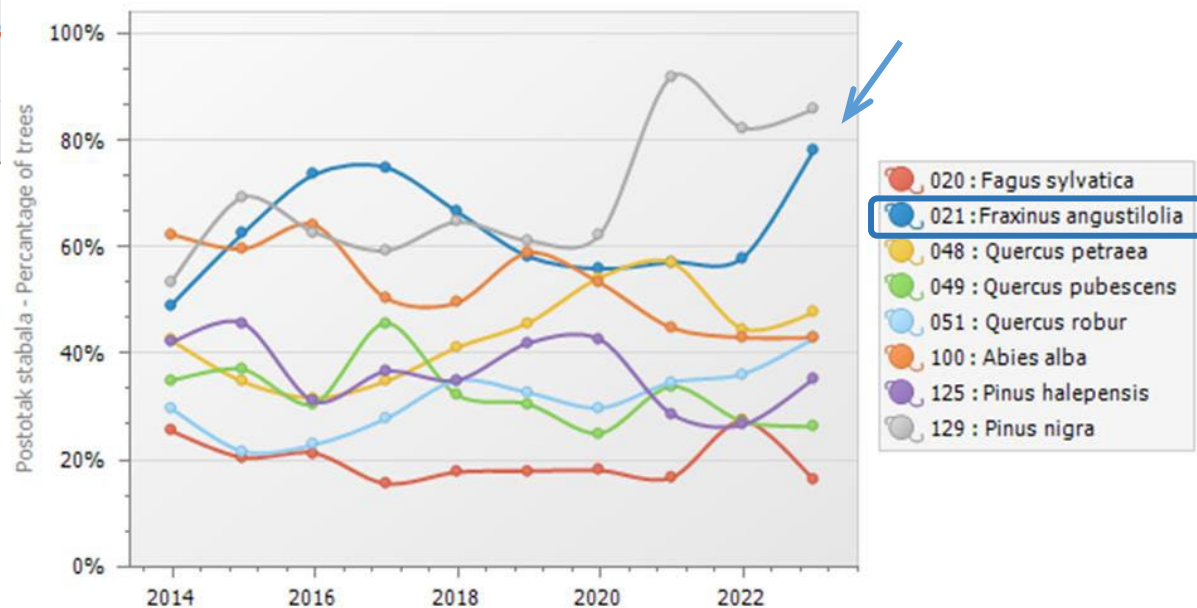
Significant crown defoliation of forest trees in Croatia in the period 2007-2021

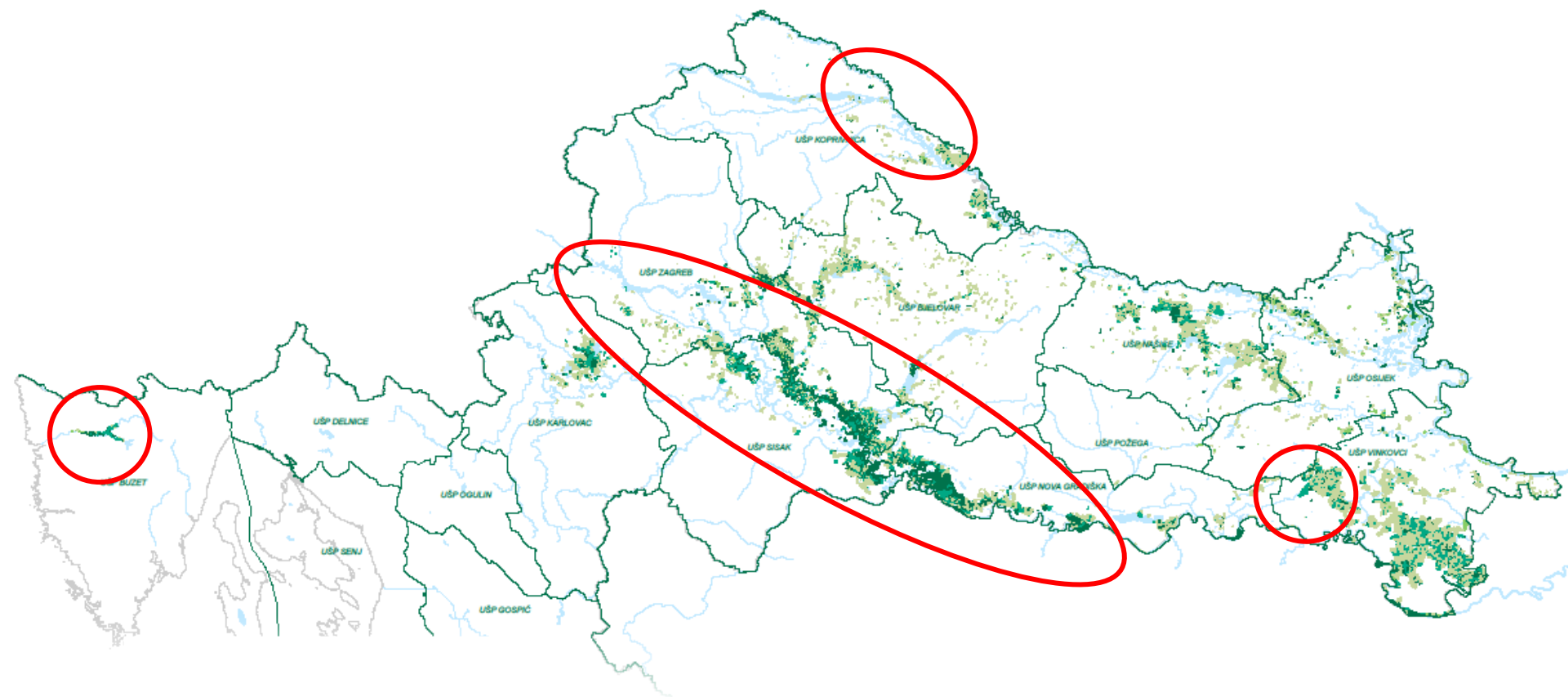
Značajna osutost glavnih vrsta drveća u RH



ICP Forests
 HRVATSKI ŠUMARSKI INSTITUT

Značajna osutost glavnih vrsta drveća u RH







Ozkolistni jesen v nižinski Hrvaški
Narrow-leaved ash in lowland Croatia



70 let star gozd
70-year old forest



30 let star gozd
30-year old forest

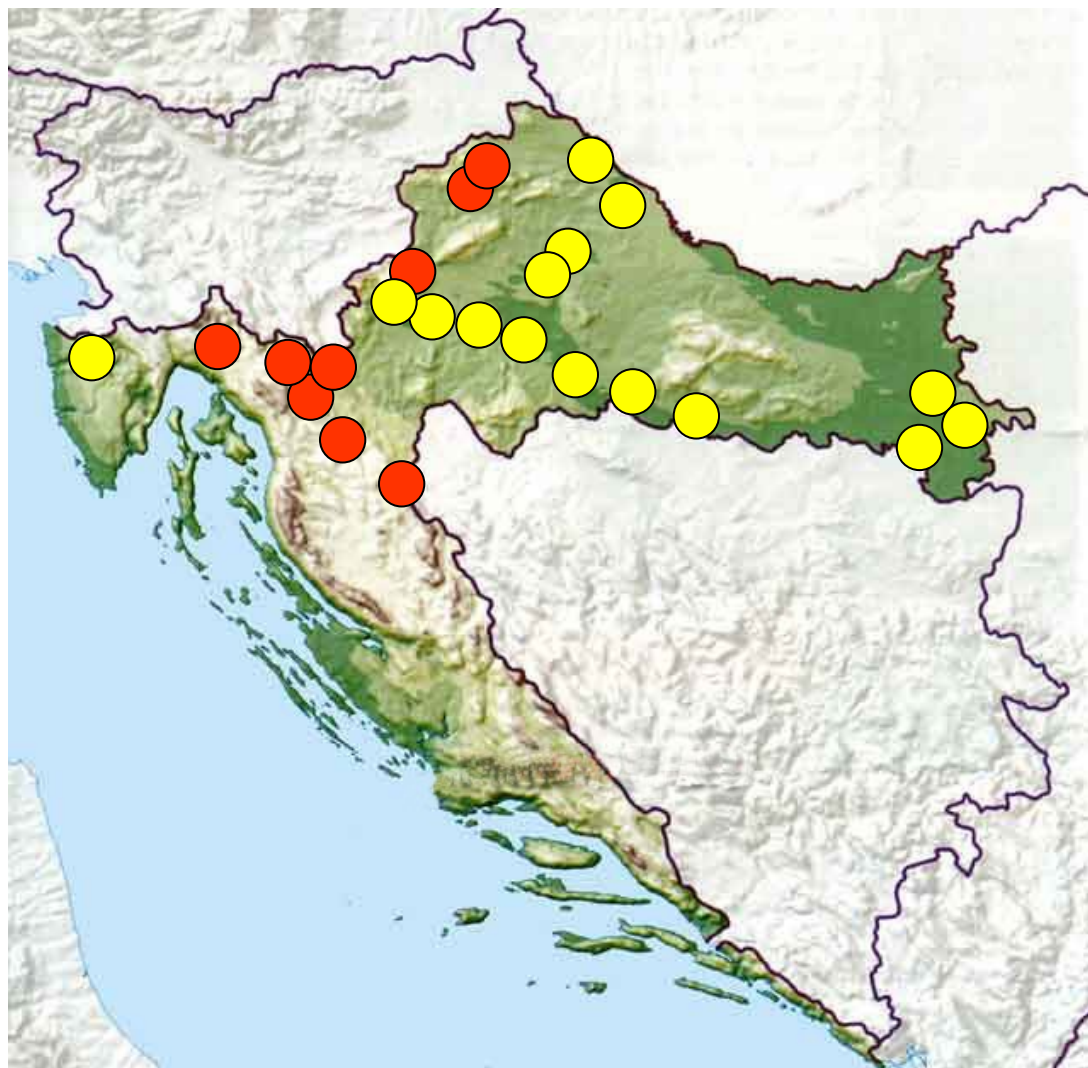


Simptomi odmiranja v Naravnem parku Lonjsko polje *Dieback symptoms in Lonjsko polje Nature Park*



Primarni vzrok odmiranja na Hrvaškem *Hymenoscyphus fraxineus*
- potrjene ugotovitve

Primary cause ***Hymenoscyphus fraxineus*** in Croatia - findings



● *Fraxinus excelsior*

1. ugotovitev 2009.
1st record 2009

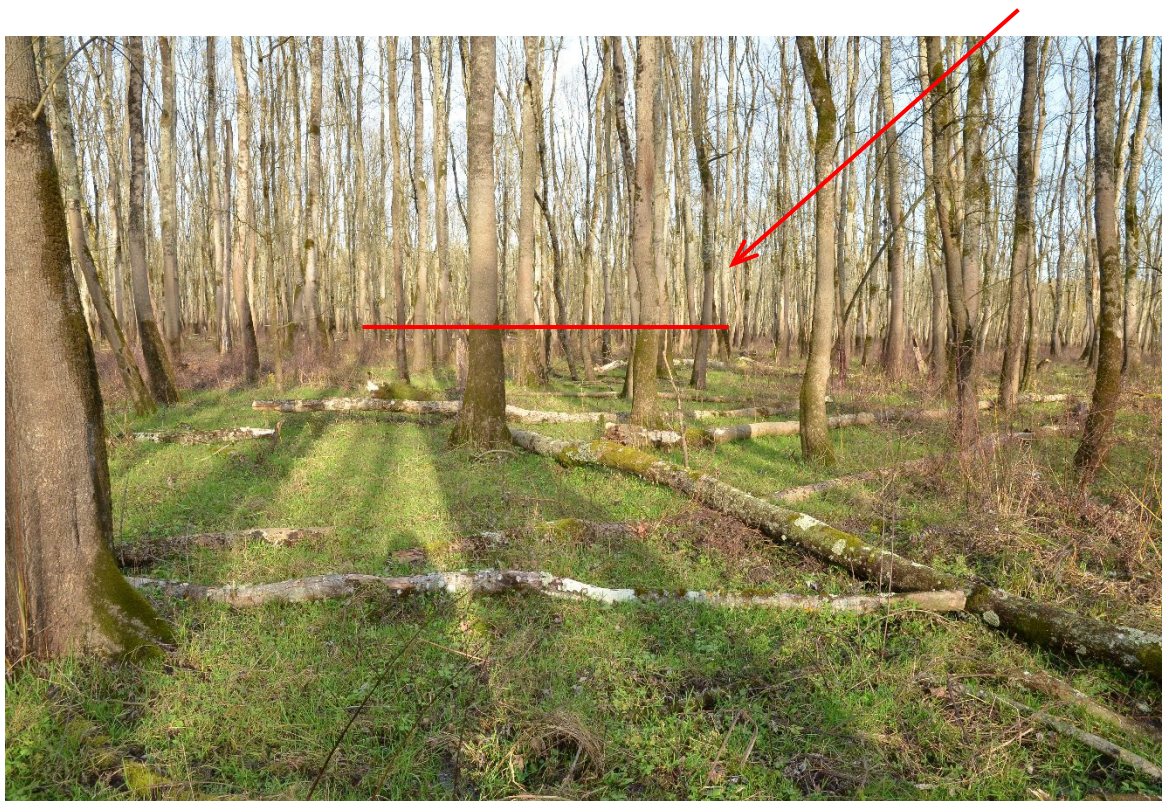
● *Fraxinus angustifolia*

1. ugotovitev 2011.
1st record 2011

Naravni park Lonjsko polje *Nature Park Lonjsko polje*



nivo poplavljene vode
level of flooded water



Naravni park Lonjsko polje *Nature Park Lonjsko polje*

Tipični simptomi / *Typical symptoms*

1.3 m



0.3 m



Naravni park Lonjsko polje *Nature Park Lonjsko polje*

Tipični simptomi / *Typical symptoms*



Naravni park Lonjsko polje *Nature Park Lonjsko polje*

Tipični simptomi / *Typical symptoms*



Naravni park Lonjsko polje
Nature Park Lonjsko polje

Tipični simptomi - korenina / *Typical symptoms - roots*



Photo/Foto: D. Jurc, N. Ogris, B. Piškur,
T. Hauptman, V. Rajh & Z. Devetak, 2010
<http://www.gozdis.si>

Hymenoscyphus fraxineus



Naravni park Lonjsko polje
Nature Park Lonjsko polje

Tipični simptomi - korenina / *Typical symptoms - roots*



Lentinus tigrinus



Tipični simptomi v dnu debla *Symptoms in the trunk base*



Ozkolistni jesen cca 60 let
Narrow-leaved ash approx. 60-year old

Vinkovci, Strizivojna

Cladosporium sp.

Kretzschmaria deusta

Trichoderma sp.

Hymenoscyphus fraxineus

Hypoxylon eurasiaticum

Daldinia sp.

Tipični simptomi / *Typical symptoms*

Zagreb, Kutina

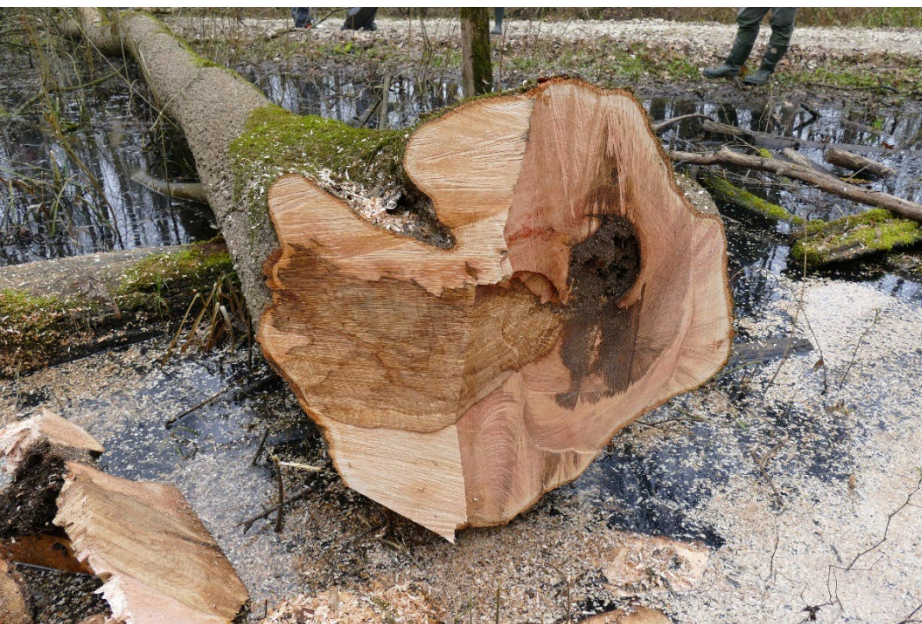


Najdene gljive / *Fungi found*

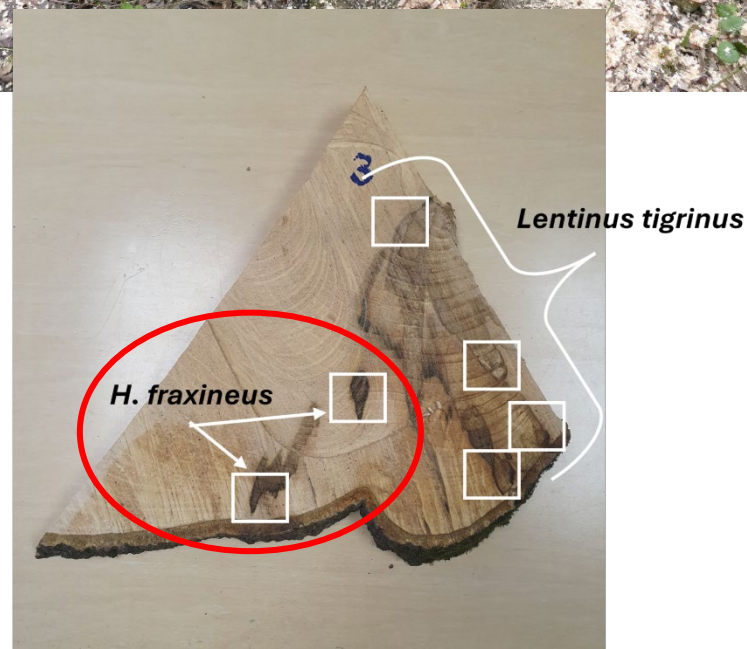
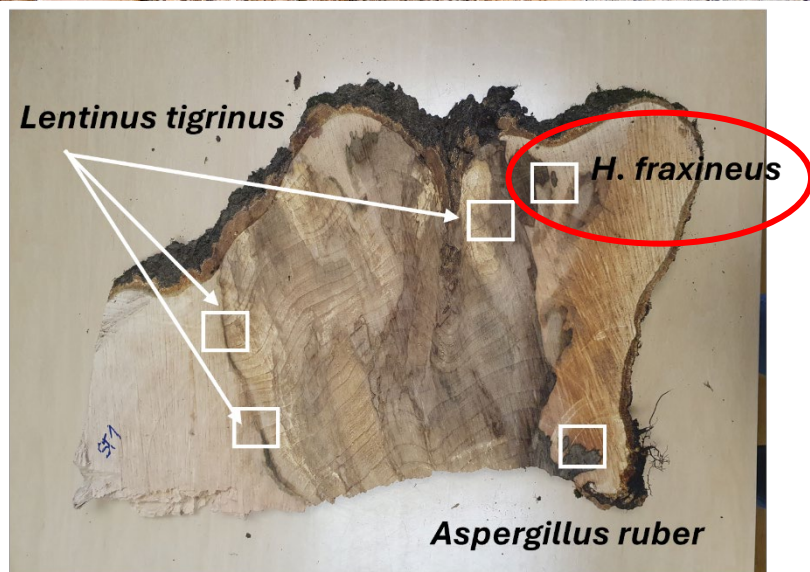
Sisak, Lonja

osutost krošenj / *crown defoliation*

20%



55%



Najdene gljive / *Fungi found*

Zagreb, Kutina

Lentinus tigrinus



Ganoderma sp.





Ozkolistni jesen v submediteranu
Narrow-leaved ash in sub-Mediterranean

Buzet, Mirna



Tipični simptomi v dnu debla *Symptoms in the trunk base*



Armillaria sp.

Diplodia fraxini

Diplodia mutila

Fusarium lateritium

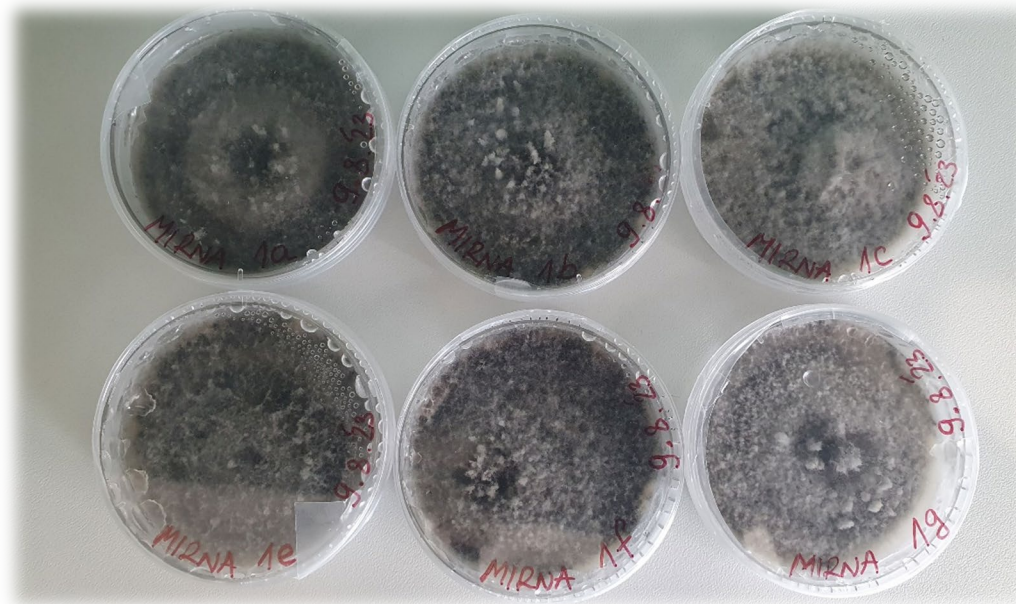
Hymenoscyphus fraxineus

Trichoderma spp.

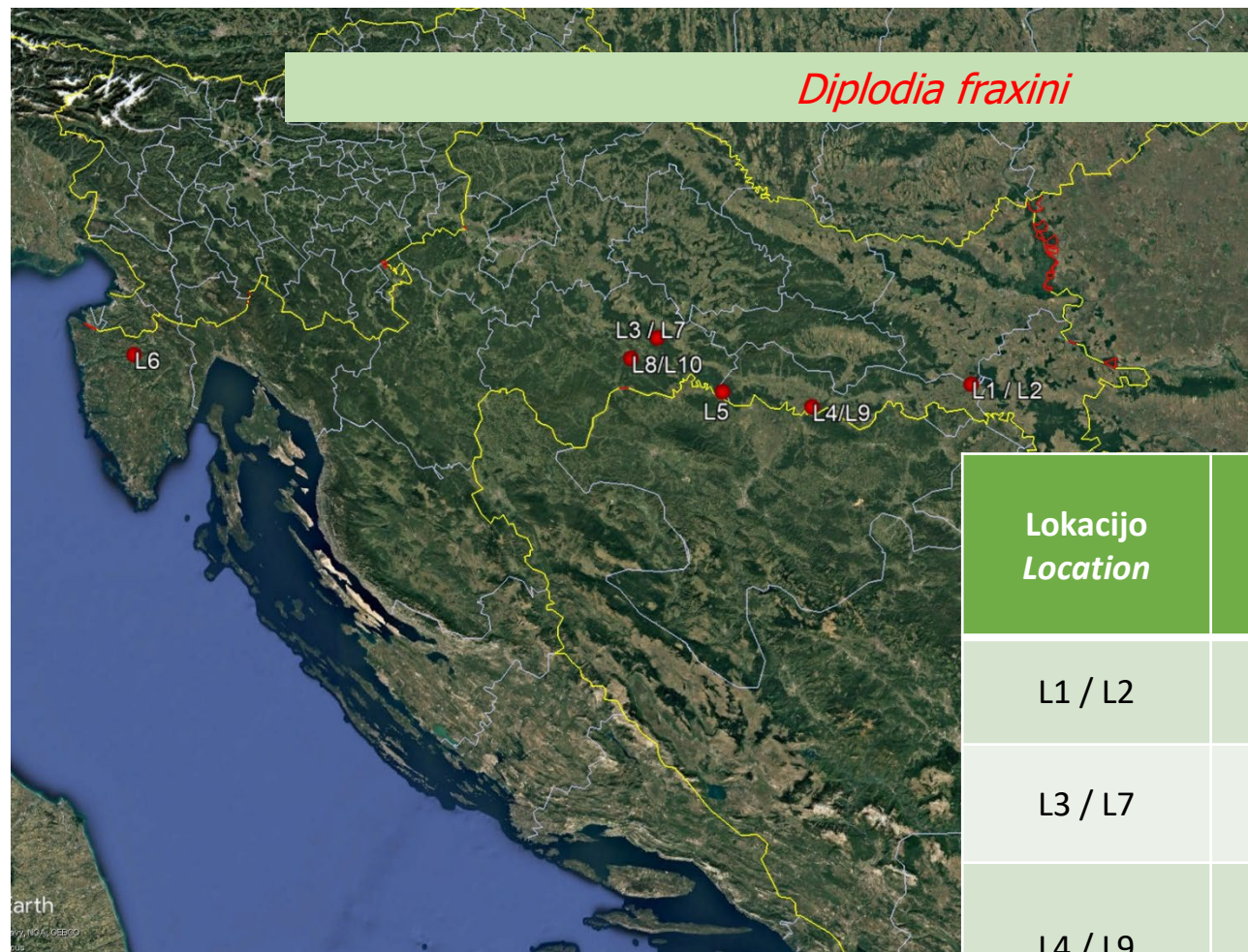
Ozkolistni jesen cca 40 let
Narrow-leaved ash approx. 40-year old

Diplodia fraxini

- Analize dreves (različne starosti in osutosti) od leta 2021 do 2025 so pokazale, da v simptomatskih poganjkih in vejah v krošnjah NI *H. fraxineus*, namesto tega v simptomatskih poganjkih prevladujejo *Diplodia* spp. i *Diaporthe* spp.
- *Tree analyses (of various age and defoliation) from 2021 to 2025 revealed that there is NO H. fraxineus in symptomatic shoots and branches in crowns, but Diplodia spp. i Diaporthe spp. instead*
- *Diplodia fraxini* predhodno potrjena v Španiji, Italiji in Sloveniji na *Fraxinus excelsior*
- *Diplodia fraxini previously confirmed in Spain, Italy and Slovenia as a pathogen of common ash*



Diplodia fraxini



Lokacija <i>Location</i>	Število dreves <i>No. of trees</i>	Vrsta vzorca <i>Sample type</i>
L1 / L2	5 (od <i>/of</i> 7)	poganjki/veje <i>shoots/branches</i>
L3 / L7	3 (od <i>/of</i> 6)	poganjki/veje <i>shoots/branches</i>
L4 / L9	3 (od <i>/of</i> 4)	poganjki/veje/deblo <i>shoots/branches/stem</i>
L5	0 (od <i>/of</i> 2)	poganjki/veje <i>shoots/branches</i>
L6	1 (od <i>/of</i> 2)	deblo <i>stem</i>
L8/L10	4 (od <i>/of</i> 4)	poganjki/veje <i>shoots/branches</i>

Diplodia fraxini

Simptomi v poganjkih/vejah/deblu

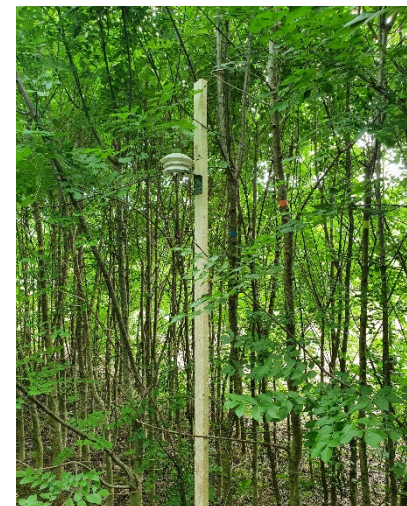
Symptoms on shoots/branches/stem



Diplodia fraxini

Test patogenosti: 6-letni ozkolistni jesen

Pathogenicity test: 6-year-old narrow-leaved ash



Diplodia fraxini

Test patogenosti: 6-letni ozkolistni jesen
= simptomi po 3 tednih

*Pathogenicity test: 6-year-old narrow-leaved ash
= symptoms after 3 weeks*



Najpogostejše najdene glive / *The most frequent fungi found*



Diplodia fraxini, *D. seriata*, *D. mutila*
Hysteroglyphium fraxini
Bionectria ochroleuca
Botryosphaeria stevensii
Fusarium spp.
Diaporthe eres
Phoma spp.

Hymenoscyphus fraxineus

v krošnjah dreves starih do 30 let

in crowns of trees up to 30-year old

Hymenoscyphus fraxineus

Kretzschmaria deusta

Ilyonectria robusta

Diplodia fraxini, *D. seriata*, *D. mutila*

Eutypa lata

Cadophora malorum | *Cadophora dextrinospora*

Fusarium solani

Lentinus tigrinus

Armillaria gallica, *A. cepistipes*

Ganoderma resinaceum, *G. adpersum*, *G. applanatum*



Veliko hvala vsem sodelavcem ki sodeluje pri raziskavi od leta 2011!
Thanks to all colleagues who have been involved in the research since 2011!

Hvala za vašo pozornost! / *Thank you for your attention!*



Research was carried out under the projects:

Conservation of narrow-leaved ash stands (*Fraxinus angustifolia* Vahl) in the Republic of Croatia with emphasis on biotic harmful factors; 2021-2025; Project leader: Danko Diminić; Ministry of Agriculture, Forestry and Fisheries of the Republic of Croatia, Funds for The Multifunctional Role of Forests (MRF) for financing scientific work in the field of forestry.



Research on the diseases and dieback cause of narrow-leaved ash in the area of FA Sisak; 2017-2018; Project leader: Danko Diminić; FA Sisak, Croatian Forests Ltd.



The role of biotic agents on vitality of narrow-leaved ash (*Fraxinus angustifolia* Vahl.) in Croatian floodplain forests (FRAXINPRO); 2014-2018; Project leader: Josip Margaletić; Croatian Science Foundation

Ecology and restoration of Posavina floodplane forests; 2013-2015; Project leader: Boris Hrašovec; Croatian Forests Ltd.