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New data on host range and geographical distribution of Dothistroma needle blight in Ukraine

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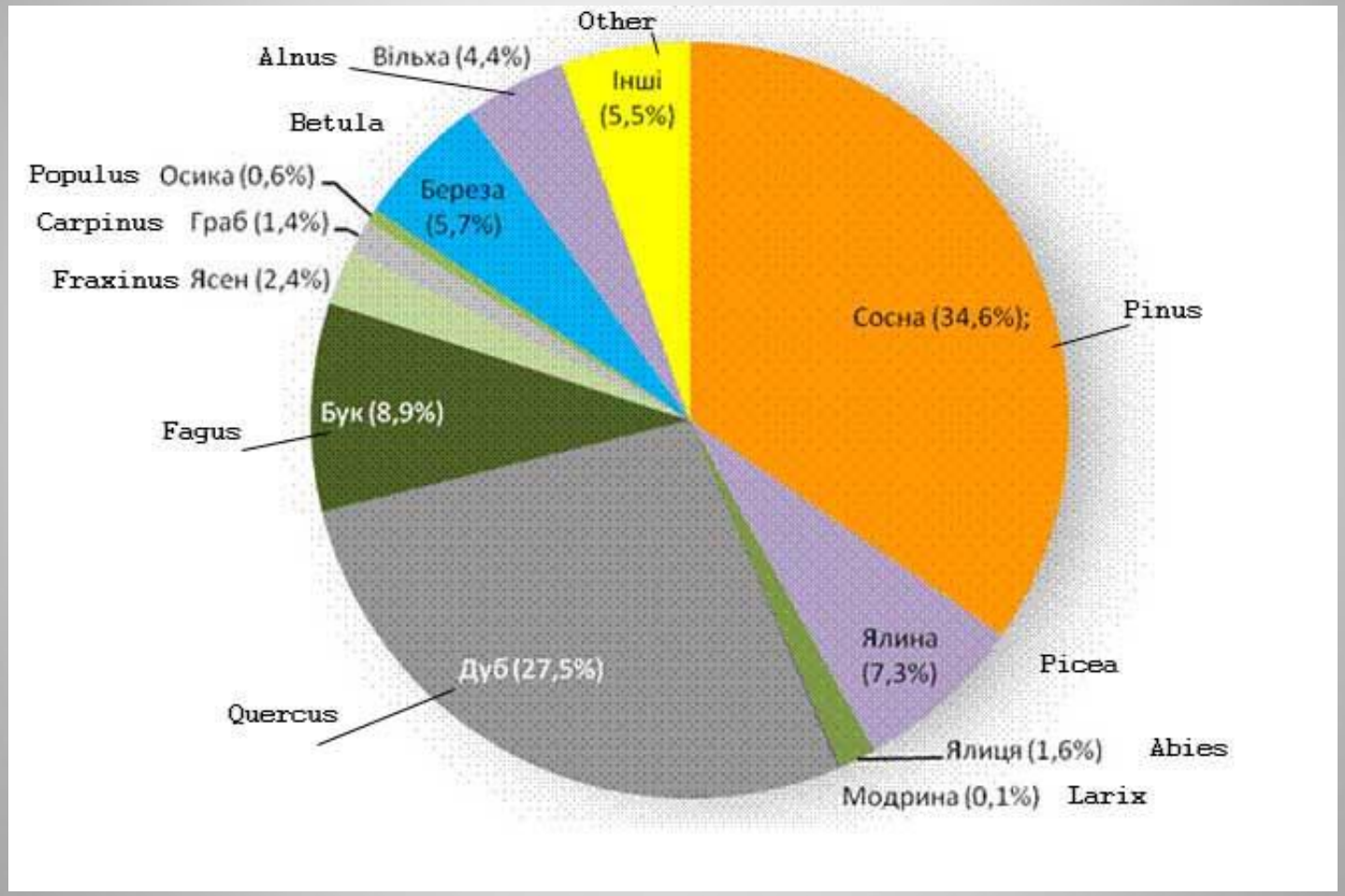
Forest area distribution by tree species (over 30 species) (State Forerst resources Agency, 2018)



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Pinus nigra* ssp. *pallasiana (Crimean pine)

Synonims: *Pinus nigra* J.F.Arnold variety *yaltirikiana* C.U.Alptekin

Pinus pallasiana lamb.

(IUCN 2015. *The IUCN Red List of Threatened Species. Version 2015-3*)

The most common species are P. sylvestris, P. nigra subsp. pallasiana

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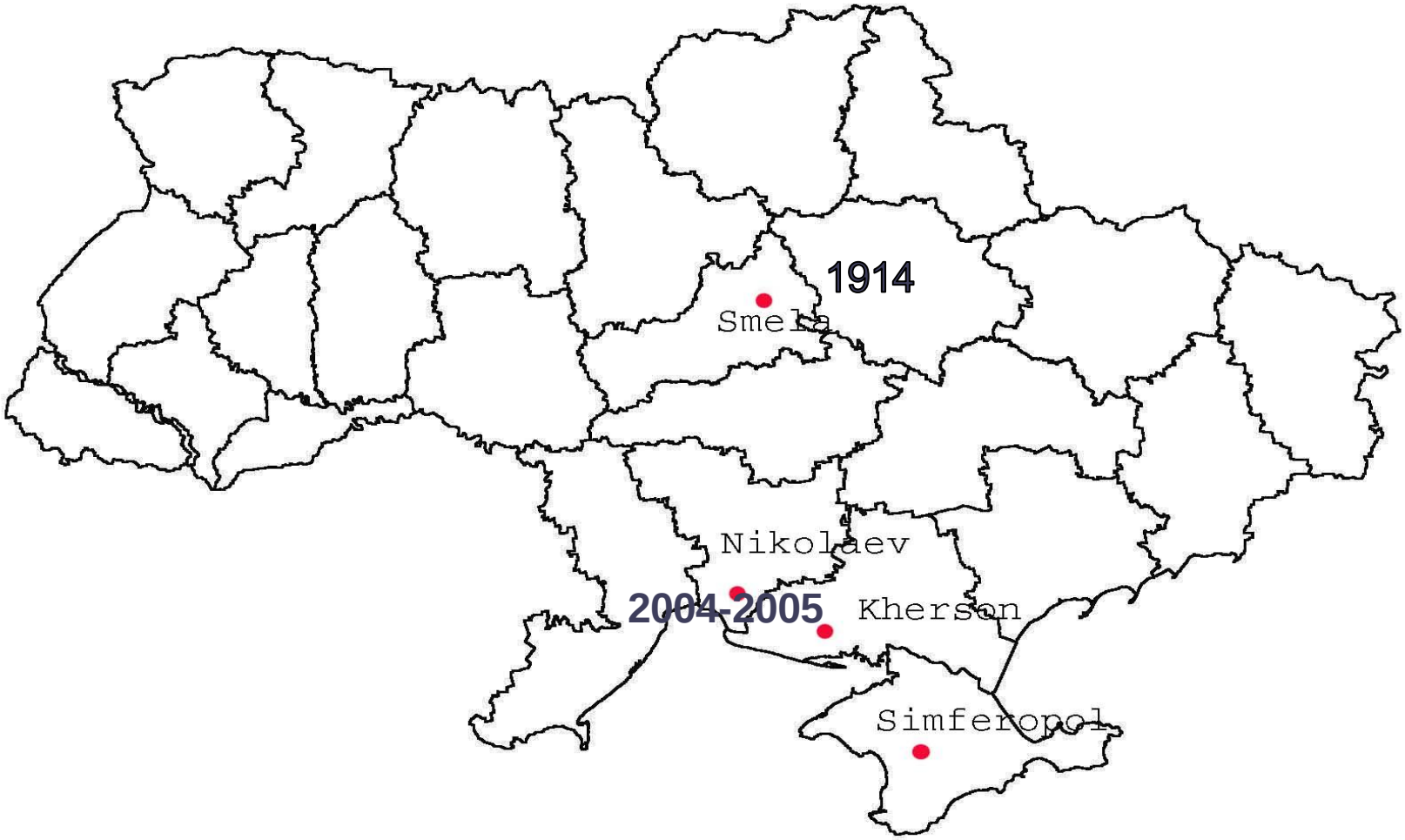
Dothistroma pini Hulbary and *Dothistroma septosporum* (Dorog.) M. Morelet in Ukraine



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Dothistroma pini Hulbary

- In November, 2004, strong needle blight was observed in the stands of *P.nigra ssp. pallassiana* 15 – 40 years old

- In 2008 collected needles from south Ukraine and south-western Russia were studied. *D.pini* was confirmed in this region.(Barnes et al., 2008)

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Dothistroma pini Hulbary

- Since the 2004, DNB has increased significantly resulting in loss of yield and decline of pine
- Most common in dense 3-25 years old stands

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We observed that DNB has dramatically increased during the last decade in south Ukraine on Crimean pine while the *P. sylvestris* has not been much affected and was observed as a tolerant species to DNB

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- South Forest Steppe zone (Kherson, Crimean pine)

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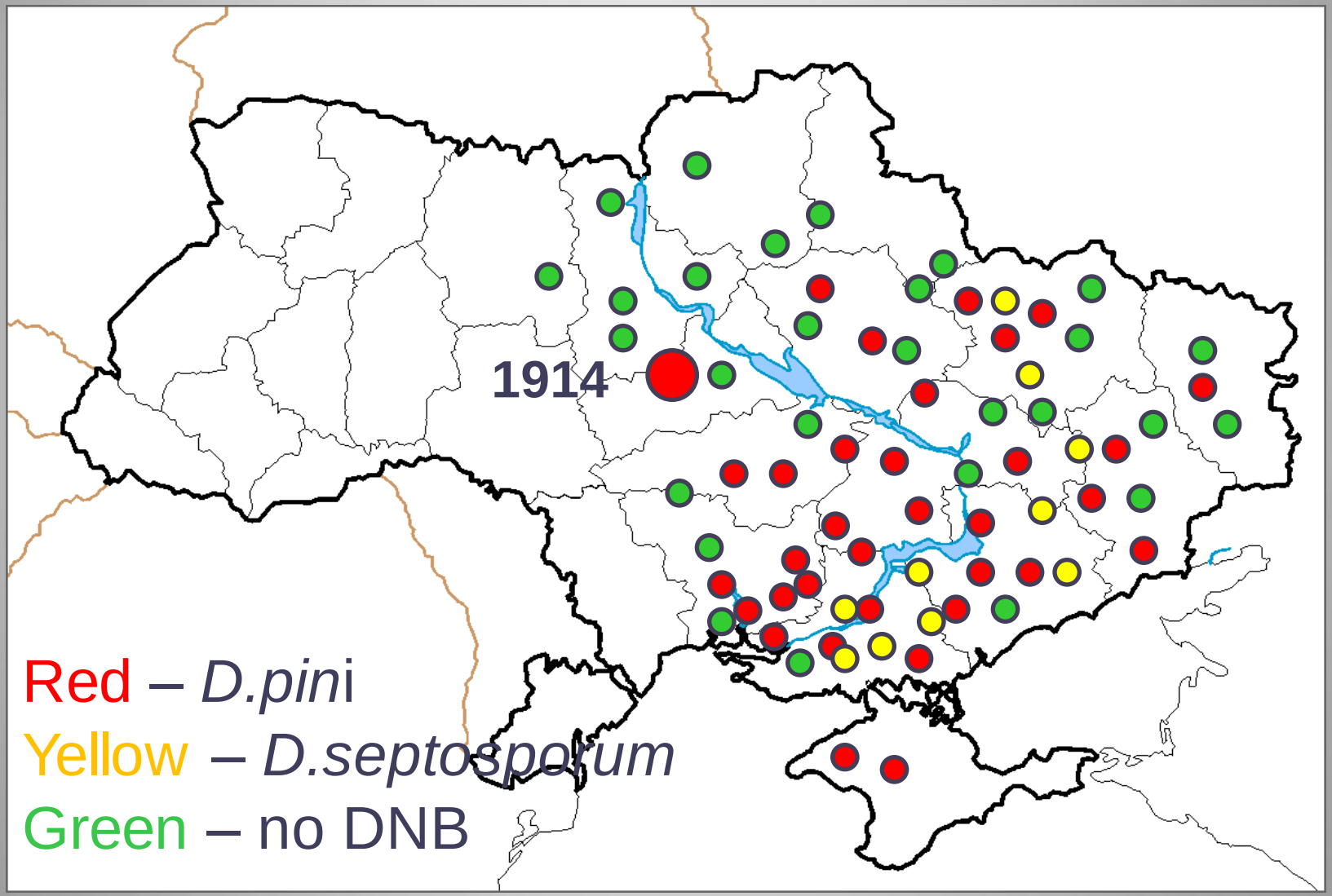
DNB in Ukraine, 2016



Region	Part of Ukraine	Pine species	*D.p*	*D.s*	Other fungal pathogens
Crimea	South	*P. nigra subsp. nigra var. pallasiana*	+	-	*Diplodia pinea,*
Kherson	South	*P. nigra subsp. nigra var. pallasiana*	+	+	*Diplodia pinea, Brunchorstia pinea*
Mikolaiiv	South	*P. nigra subsp. nigra var. pallasiana*	+	+	*Diplodia pinea, Brunchorstia pinea*
Kharkiv	East	*P. nigra subsp. nigra var. pallasiana*	+	-	*Diplodia pinea*
Kharkiv	East	*P.sylvestris*	+	+	*Diplodia pinea*
Kharkiv	East	*P.nigra*	+	-	
Kharkiv	East	*P. mugo*	+	+	
Kharkiv	East	*P. strobus*	-	-	
Kharkiv	East	*P. tunbergii*	-	+	
Kharkiv	East	*P. densiflora*	+	+	

Other pathogens - Spheropsis sapinea

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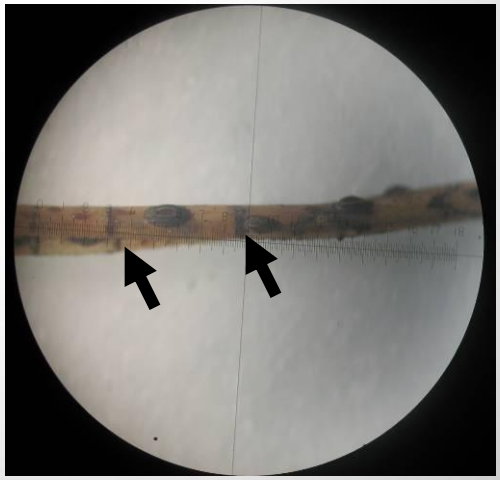
Lophodermium seditiosum Mint

L. pinastri



L. seditiosum

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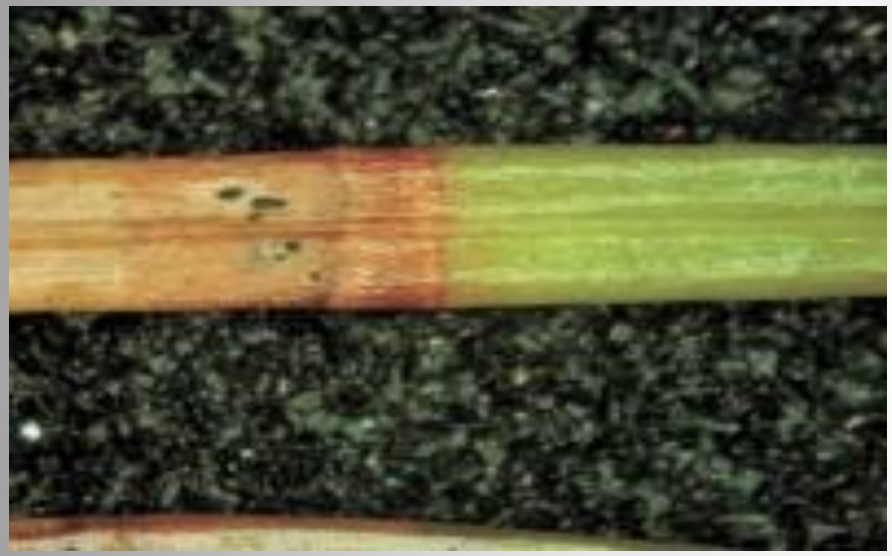
Sclerophoma pithyophila



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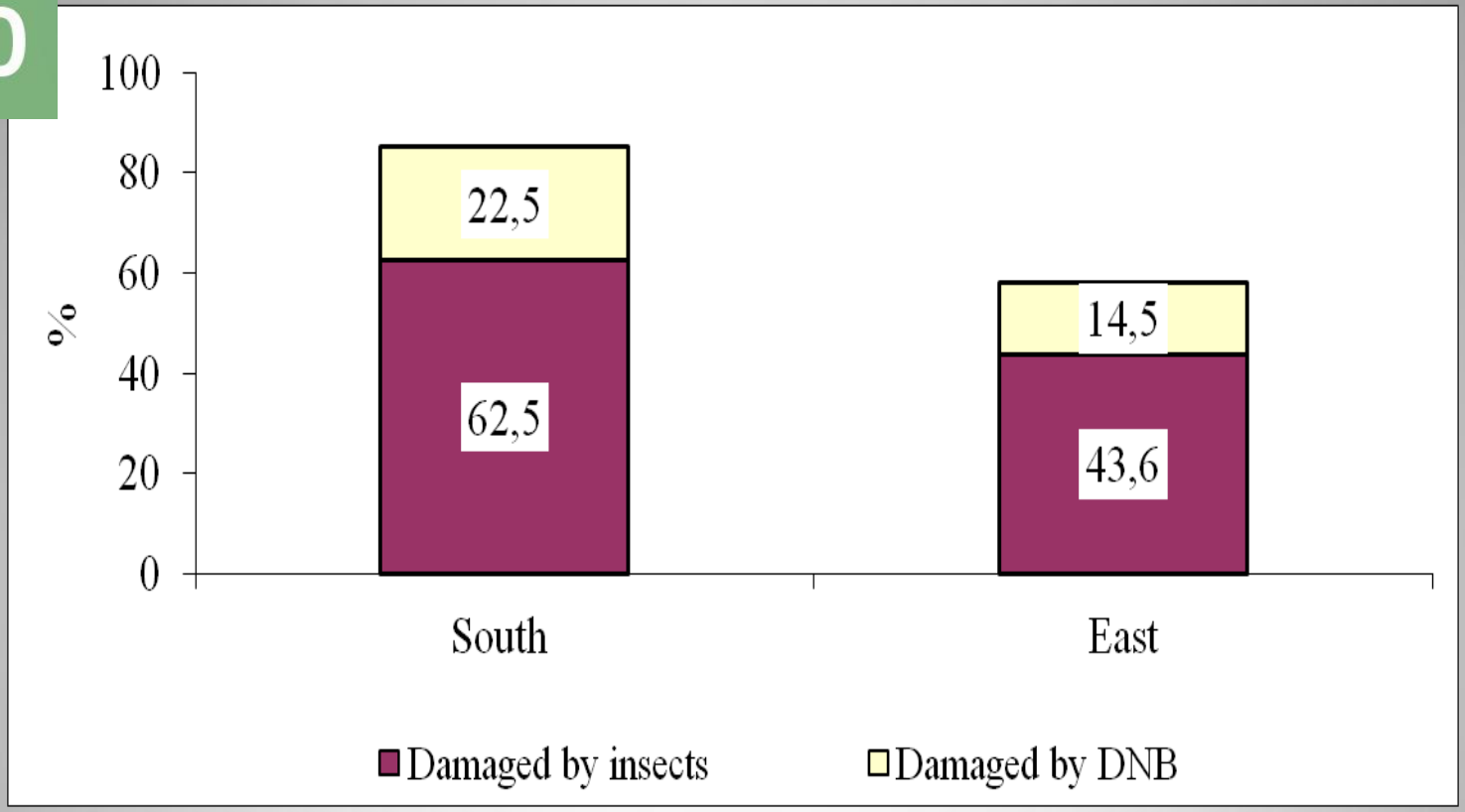
Gremmeniella abietina



- Damage by insect dominated in South and East forest stands 10-50-year old while damage by DNB amounts by 22.5 and 12.4 % respectively.

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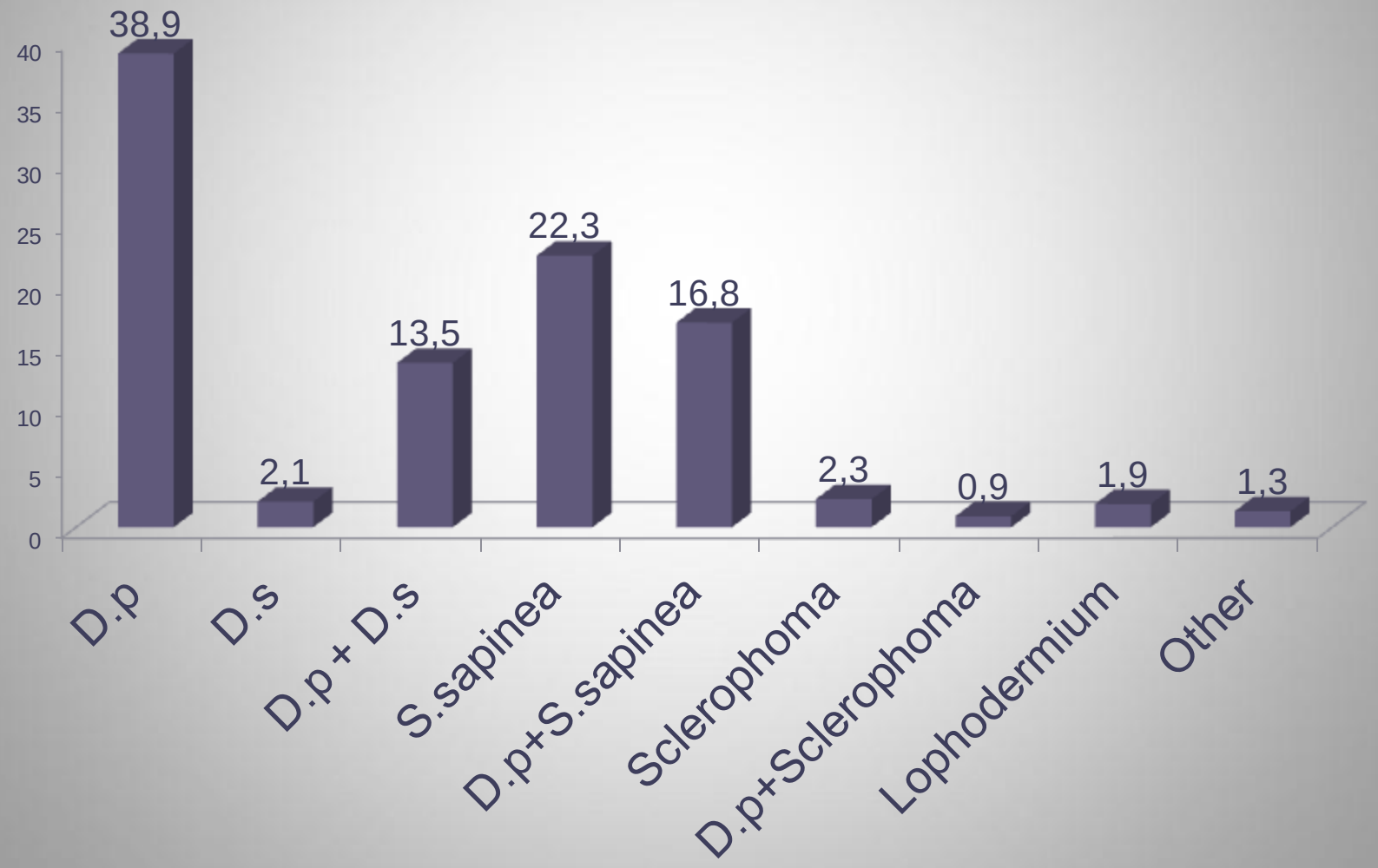
Different needle diseases on Pinus nigra ssp.*pallasiana*



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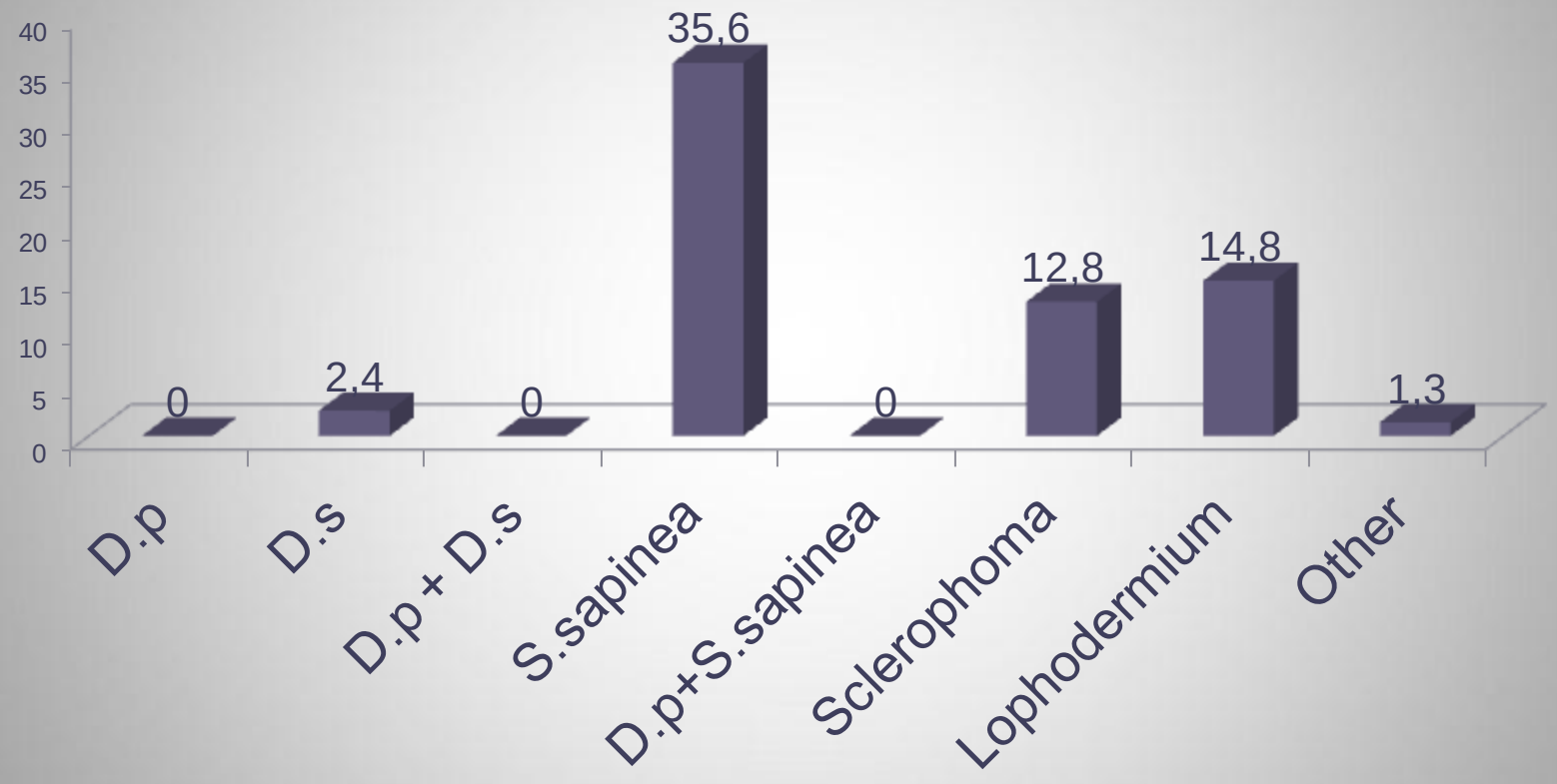
fferent needle diseases on *Pinus sylvestris*



Conclusions

- Conventional PCR and primers specific to *D. septosporum* and *D.pini* have been used to identify the fungus directly from DNA extracted needle material.
- DNB was detected for 8 pine species including 3 subspecies and 2 spruce species, among them *Pinus nigra* subsp. *pallasiana* and *P. sylvestris* were the most frequent hosts.
- Results showed that both *D. septosporum* and *D. pini* were present on *P. nigra subsp. pallasiana* on the same trees and even in the same needles. Moreover, D. septosporum was found first in Ukraine on *Pinus ponderosa* Douglas, *Pinus banksiana* Lamb and *Pinus contorta* Douglas in the arboretum as well as *Picea pungens* Engelm and *Picea abies* (L.) H. Karst.
- For Ukraine, *D. pini* was found *on P.nigra* pallasiana and *on P.mugo, P.densiflora, P.tunbergii, P.nigra* and *P.sylvestris*
- Also, we detected of complex of fungal pathogens of pine needle as *a Diplodia pinea, Brunchorstia pinea, Cyclaneusma minus*, Lophodermium spp etc which were spread on the pine needle samples infected by DNB.

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