



Forests, their Products and Services (FPS) in Montenegro

Dr Milić Čurović & Dr Jelena Lazarević

**University of Montenegro
Biotechnical faculty**

Podgorica, March 7th, 2016



Department for Forestry

Performs research in the area of:

- forest management, policy and ecology
- forest protection, nursery production of forest plants and molecular characterisation of pathogenic and symbiotic fungi.

Moreover, Department is authorized by the Forestry Directorate to perform activities prescribed by the Law on Reproductive material of Forest Trees.

Forest covers **59,9 %** of territory of
Montenegro

forest land covers **9,8 %**

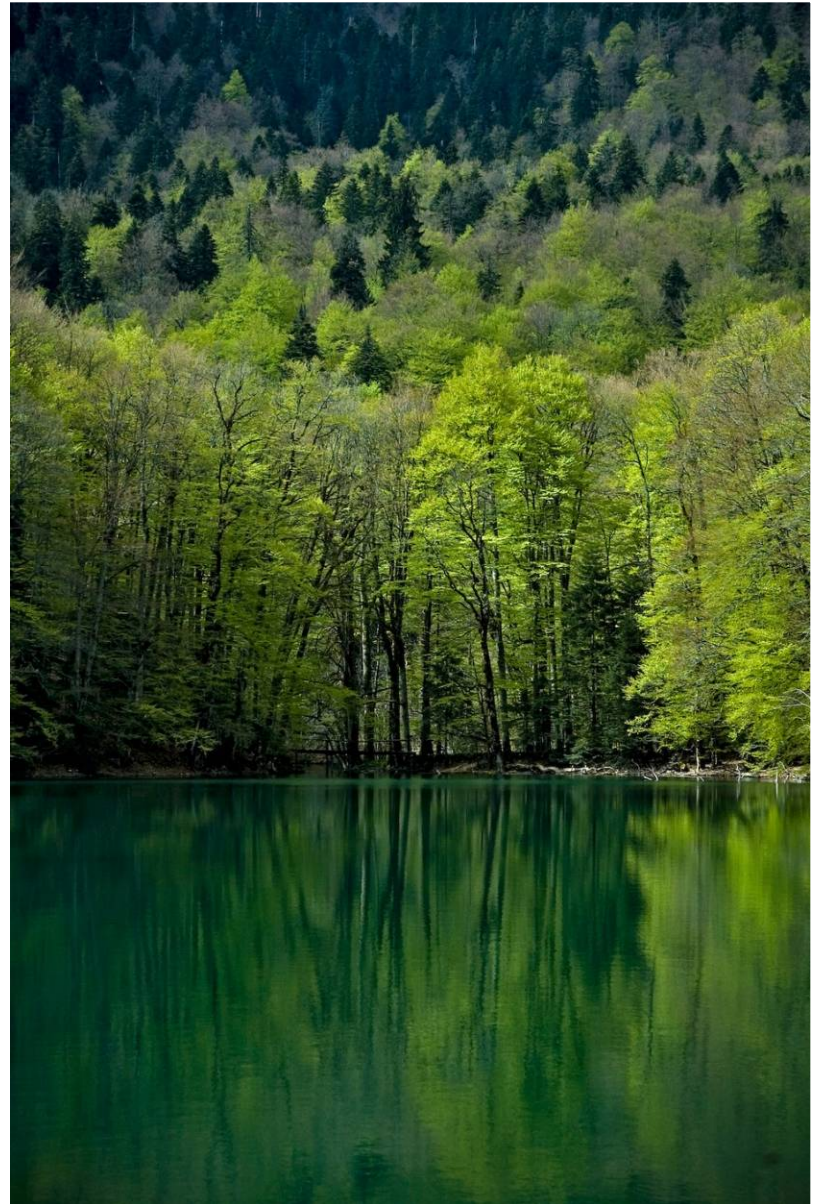
National Forest Inventory (2009-2011)

- 70 species of trees,
 - 90 species of shrubs
 - 40 species of ground flora
- *NFI (2009-2011)

The forests of Montenegro are natural and vital, with natural regeneration, good structure and high biodiversity level.

Biodiversity in Montenegro:

- Index of floristic diversity = 0.86
- More than 3600 taxa of vascular plants
(Stešević i Jovović, 2008)
- More than 220 endemics



FPS COST Action FP1102

Determining Invasiveness And Risk Of Dothistroma (DIAROD)

Start of Action: 05/12/2011

End of Action: 04/12/2015

29 countries were involved

Montenegro participation in FP 1102:
30/07/2015 as Cost Near Neighbour Country
since **April 2013**

MC observer/MC Member: **Dr Jelena Lazarević**
University of Montenegro, Biotechnical Faculty

- participation on 2 annual meetings,
- 2 WG meetings,
- 1 training school,
- 2 STSMs



Training School on Molecular Detection and Population Genetics of Dothistroma Needle Blight Pathogens

3rd to 7th March 2014, Uppsala, Sweden

Participant from MNE: Dr Jelena Lazarević, University of Montenegro, Biotechnical faculty



DIAROD training workshop
Trainers and participants
March 2014 - Sweden

COST-STSM-FP1102-16414 :

STSM Topic: Learning molecular techniques to identify DNB in field samples

Participant: **Dr Jelena Lazarević**, University of Montenegro, Biotechnical faculty

Host: **Dr Hanna Milberg**, Department of Forest Mycology and Plant Pathology, Swedish University of Agricultural Sciences, Uppsala, Sweden
Period: 08.03-30.04. 2014

COST-STSM-FP1102-26562:

STSM Topic: Identification of DNB from field samples/occurrence of DNB at high altitude pine forests

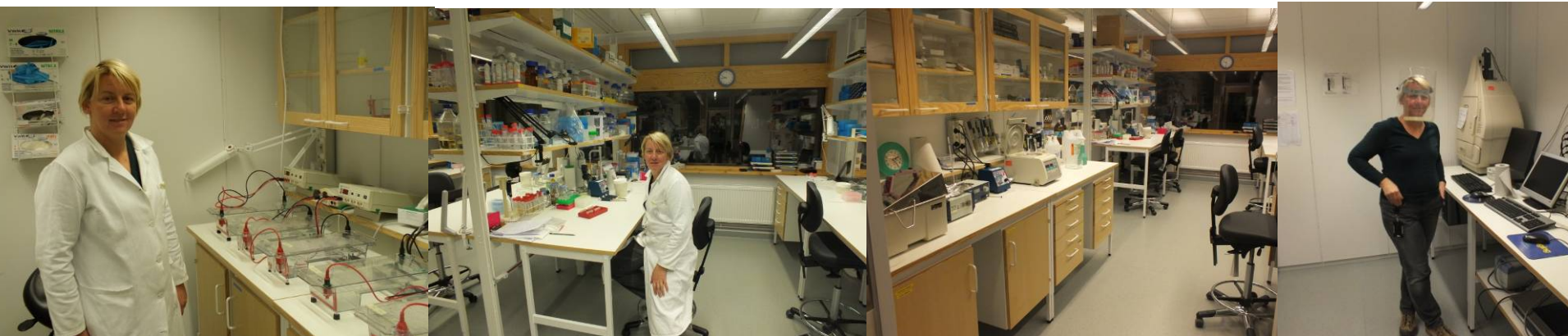
Participant: **Dr Jelena Lazarević**, University of Montenegro, Biotechnical faculty

Host: **Dr Audrius Menkis**, Department of Forest Mycology and Plant Pathology, Swedish University of Agricultural Sciences, Uppsala, Sweden
Period: 1.06-30.06.2015

More than **350** samples from different pine forests from Montenegro were analyzed

Sampling was financially supported by a grant from the Ministry of Science and Ministry of Agriculture and Rural Development of Montenegro, project contract nmb 01-406/01-558.

**Department of Forest Mycology and Plant Pathology,
Swedish University of Agricultural Sciences, Uppsala,
Sweden**



Pinus sp. in Montenegro

	share per area	share per volume
<i>Pinus halepensis</i> Mill.	/	/
<i>P. heldreichii</i> Christ	1.1 %	1.9%
<i>Pinus mugo</i> Turra	/	/
<i>Pinus nigra</i> Arnold	1.6%	2.8%
<i>Pinus peuce</i> Griseb.	0.6%	1.3%
<i>Pinus pinea</i> L.	/	/
<i>Pinus silvestris</i> L.	1.0%	1.4%

source: NFI (2008-2011)



D.septosporum and *D. pini* were identified with species specific primers from symptomatic or almost asymptomatic needles. Only from one site *Dothistroma* was detected based on morphology



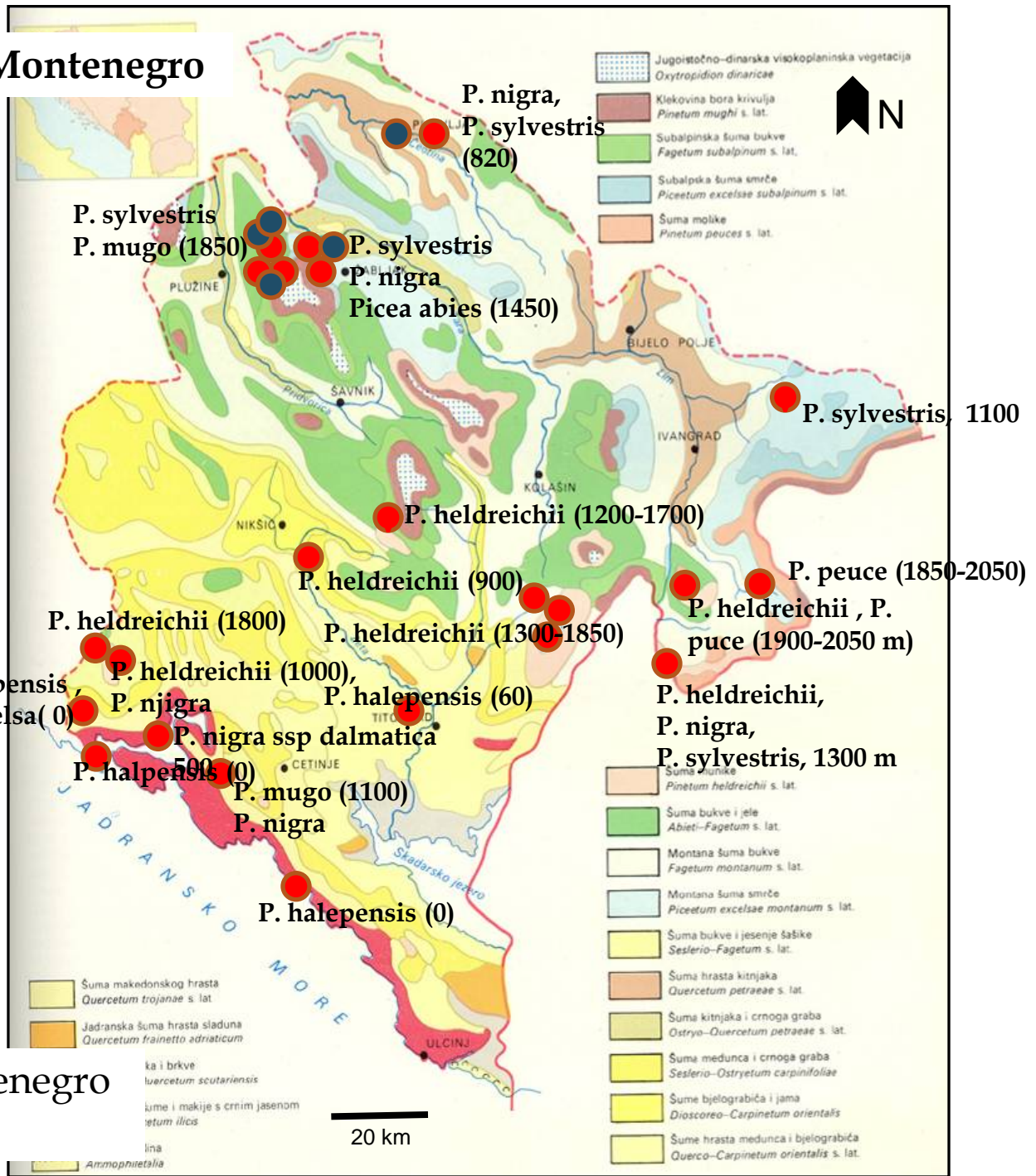
Dothistroma sp., on *P. heldreichii*,
loc. Prokletije, Ropojana;



acervuli on *P. heldreichii*; conidia

Distribution of DNB in Montenegro

- *D. septosporum*
- *D. pini*



The intensity of the DNB in Montenegro is low.

probably due to the fact that forest vegetation is native, with a low amount of plantations of susceptible trees, and due to the climatic conditions in some areas, which are probably not favorable for DNB development.



Collaborative work and publications on
DIAROD :

- Participation in creation of DOTHISTROMA GEODATABASE, ca 50 records were submitted:

Dothistroma interactive map:

- Scientific papers published:

Mycol. Monten. XVII (2014): 119-131

INCIDENCE OF DOTHISTROMA SEPTOSPORUM IN DIFFERENT PINE FOREST IN MONTENEGRO

Lazarević J1., Davidenko K.2, Millberg H.3

1Biotechnical Faculty, University of Montenegro, Podgorica, Montenegro;

2Ukrainian Research Institute of Forestry & Forest Melioration, Kharkov, Ukraine;

3Department of Forest Mycology and Plant Pathology, Swedish University of Agricultural Sciences,
Uppsala, Sweden

Global geographic distribution and host range of *Dothistroma*: a comprehensive review

By R. Drenkhan^{1,49,*}, V. Tomešova-Haataja^{2,*}, S. Fraser^{3,*}, R. E. Bradshaw^{4,*}, P. Vahalik^{2,*}, M. Mullett^{5,*}, J. Martin-Garcia^{6,7,*}, L. Bulman^{8,*}, M. J. Wingfield⁹, T. irisits¹⁰, T. L. Cech¹¹, S. Schmitz¹², R. Baden⁴, K. Tubby⁴, A. Brown⁴, M. Georgieva¹³, A. Woods¹⁴, R. Ahumada¹⁵, L. Jankovsky², I. M. Thomsen¹⁶, K. Adamson¹, B. Marcais¹⁷, M. Vuorinen¹⁸, P. Tsopelas¹⁹, A. Koltay²⁰, A. Halasz²¹, N. La Porta^{22,23}, N. Anselmi²⁴, R. Kiesnere²⁵, S. Markovskaja²⁶; A. Kačergius²⁷; I. Papazova-Anakieva²⁸, M. Risteski²⁸, K. Sotirovski²⁸, **J. Lazarević²⁹**, H. Solheim³⁰, P. Boroń³¹, H. Braganca³², D. Chira³³, D. L. Musolin³⁴, A. V. Selikhovkin³⁵, T. S. Bulgakov³⁶, N. Keča³⁷, D. Karadžić³⁷, V. Galovic³⁸, P. Pap³⁸, M. Markovic³⁸, L. Poljakovic Pajnik³⁸, V. Vasic³⁸, E. Ondruškova³⁹, B. Piškur⁴⁰, D. Sadiković⁴⁰, J. J. Diez-Casero^{5,6}, A. Solla⁴¹, H. Millberg⁴², J. Stenlid⁴², A. Angst⁴³, V. Queloz⁴³, A. Lehtijarvi⁴⁴, H. T. Doğmus-Lehtijarvi⁴⁵, F. Oskay⁴⁶, K. Davydenko⁴⁷, V. Meshkova⁴⁷, S. Woodward⁴⁸, I. Barnes⁹,

FPS COST Action FP1103

Fraxinus dieback in Europe: elaborating guidelines and strategies for sustainable management (FRAXBACK)

Start of Action: 25/04/2012

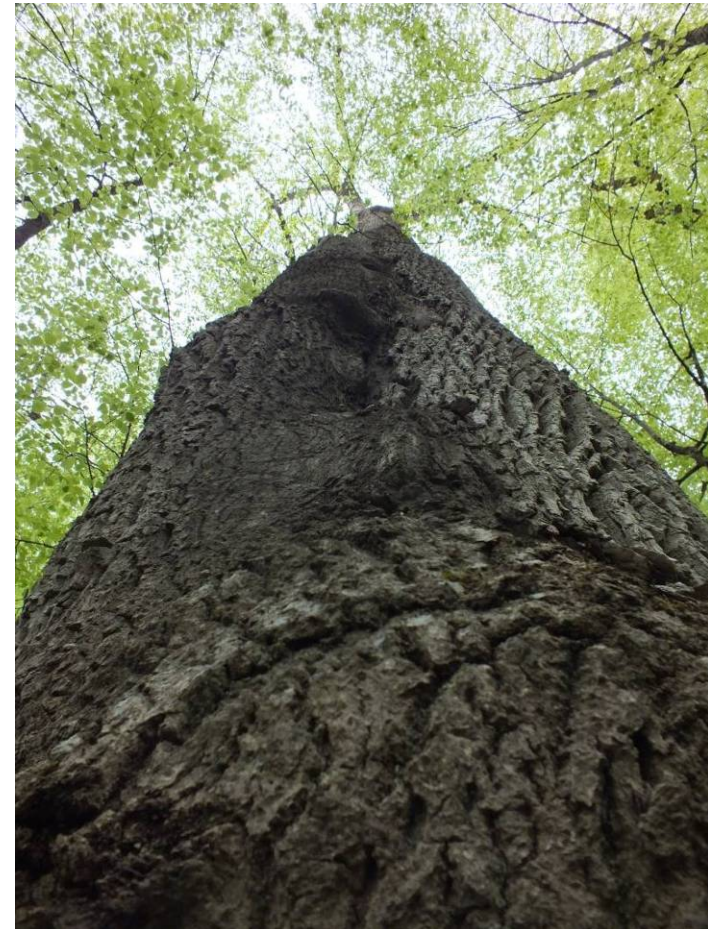
End of Action: 24/04/2016

33 countries were involved

Montenegro participation in FP 1103:
as Cost Near Neighbour Country since **April 2013**

MC observer/MC Member: **Dr Jelena Lazarević**
University of Montenegro, Biotechnical Faculty
Other participants: Branislav Perić, Dr Ana Topalović

- participation on 2 annual meetings,
- 1 STSMs was preapproved





The fungus ***Hymenoscyphus fraxineus***, known as cause of ash dieback widespread in Northern and Eastern Europe.

Monitoring and researches were conducted in different ash forests through Montenegro. Symptomatic branches, leaves and buds, also as fallen leaves and petioles were collected and analyzed in Lab for Forestry research at BTF...

- ***Fraxinus excelsior*** (Biogradska gora, Gusinje, Mateševo, Andrijevice)
- ***Fraxinus angustifolia*** (Zeta valley, Skadarsko lake, Buljarice....)
- ***Fraxinus ornus*** (submediterranean region, Podgorica, Komarnica, etc)

COST STSM Reference Number: COST-STSM-FP1103-32332

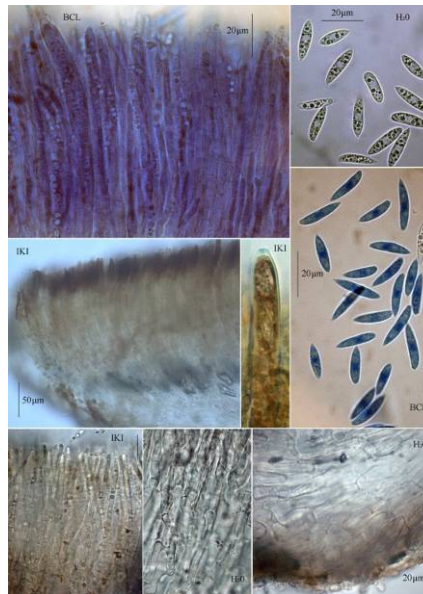
STSM Topic: Learning molecular techniques for genetical characterization and phylogeny of Ascomycetes-example of genus *Hymenoscyphus*

Participant: Dr Jelena Lazarević, University of Montenegro, Biotechnical faculty

Host: Dr Audrius Menkis, Department of Forest Mycology and Plant Pathology, Swedish University of Agricultural Sciences, Uppsala, Sweden



Photo B. Perić



H. fructigenus & *H. rokebyensis*

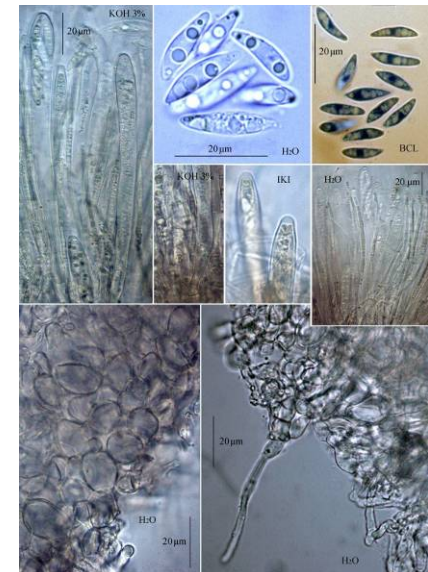


Photo B. Perić

FPS COST Action FP1305

Linking belowground biodiversity and ecosystem function in European forests (BioLink)

Start of Action: 14/05/2014

End of Action: 13/05/2018

33 countries were involved

Montenegro participation in FP 1305:
as Cost Near Neighbour Country since **2015**

MC observer/MC Member: **Dr Jelena Lazarević**
University of Montenegro, Biotechnical Faculty

- participation on 1 annual meeting and Conference: **Soil Biological Communities and Aboveground Resilience**, one research paper were presented as e-Poster

Soil Biological Communities and Aboveground Resilience

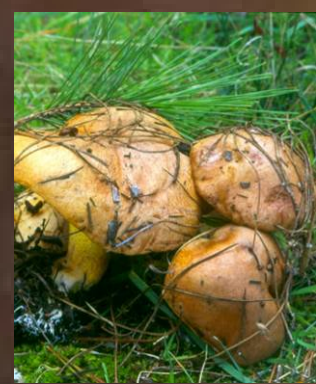
COST Action FP1305 BioLink:
Linking belowground biodiversity and ecosystem function in European
forests

3rd Annual Meeting
Rome, 17-19 November 2015

**Application of autochthonous fungi and forest soil for seedling mycorrhization
– trials in Montenegro**

Jelena Lazarević

University of Montenegro Biotechnical Faculty
Mihaila Lalića 1, Podgorica, Montenegro
ena.lazarevic@gmail.com



FPS COST Action 1401

A global network of nurseries as early warning system against alien tree pests (Global Warning)

Start of Action: 02/12/2014

End of Action: 01/12/2018

33 countries were involved

Montenegro participation in FP 1401:
19/01/2016

MC Member: **Dr Jelena Lazarević**

University of Montenegro, Biotechnical Faculty

FPS COST Action FP1202

Strengthening conservation: a key issue for adaptation of marginal/peripheral populations of forest trees to climate change in Europe (MaP-FGR)

Start of Action: 08/11/2012

End of Action: 07/11/2016

37 countries were involved

Montenegro participation in FP 1202:
as Cost Near Neighbour Country since
2013

MC observer/MC Member: **Dr Milić Čurović**
University of Montenegro, Biotechnical Faculty

- participation on 1 annual meeting,
- 1 WG meeting,
- 1 training schol,
- 1 STSM



TRAINING SCHOOL 2015

Forest genetic resources of marginal populations of forest trees at high elevation edge

31 August 2015 - 4 September 2015

Co-organized with the Alpine Study Centre (University of Tuscia, Italy)

Venue: Alpine Study Centre, Pieve Tesino (Italy)

Participant: **Srdjan Pejovic, M.Sc** (Phd student in Freiburg Germany)



COST-STSM-FP1202-32290

STSM Topic: **Learning molecular techniques for genetic characterization of forest tree populations- example of *Pinus heldreichii***

Participant: **Ivana Stojanović, M.Sc** , University of Montenegro, Biotechnical faculty

Host: **Giovanni Giuseppe Vendramin**, National Research Council, Institute of Biosciences and BioResources, Florence(IT),

Period: 01.03-31.03. 2016.

- *P. heldreichii* is subendemic on the Apennines and the Balkans, and population genetics studies on this species are scientifically important.
- During the training, plant material from *Pinus heldreichii* populations from Montenegro will be sampled and processed.



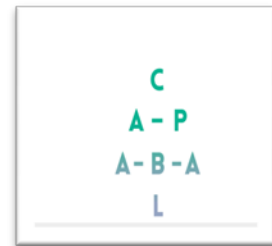


- The purpose of this STSM will be the introduction of molecular techniques for genetic characterization of forest tree populations.
- The training will focus on **genetic characterization of** three ***P. heldreichii*** populations from Montenegro (on southwest, central and south east part of the country), represented with 50 geo-referenced individuals per populations.
- Genetic characterization will be conducted with nuclear and chloroplast microsatellite markers (nSSRs and cpSSRs).

Pinus	sylvestris	Italy	Ticino	degree/minute/second	45° 32'	8° 32'	150-200
Pinus	sylvestris	Italy	Olgelasca	degree/minute/second	45° 44'	9° 11'	350
Quercus	frainetto	Italy	Bosco Rubbio	degree/minute/second	39°59'36"	16°13'06"	-
Juniperus	phoenicea	Jordan	Petra	degree/minute/second	30°19'	35°26'	880
Picea	abies	Montenegro	Kovac	WGS84 UTM	6591917	4818492	1350
Picea	abies	Montenegro	Ljubisnja	WGS84 UTM	6588992	4801529	1500
Picea	abies	Montenegro	Tepacke sume	WGS84 UTM	6588992	4801529	1500
Picea	abies	Montenegro	Baloticke sume	WGS84 UTM	6680100	4740620	1600
Abies	alba	Montenegro	Backo-Besnicke sume	WGS84 UTM	6689000	4746677	1300
Abies	alba	Montenegro	Kovac	WGS84 UTM	6594805	4818929	1150
Abies	alba	Montenegro	Maocnica	WGS84 UTM	6620038	4780334	1300
Pinus	nigra	Montenegro	Mrtvica-Tivran	WGS84 UTM	6665300	4755819	1150
Pinus	silvestris	Montenegro	Gornji Saranci	WGS84 UTM	6602615	4772706	1350
Pinus	peuce	Montenegro	Babino polje - Treskavac	WGS84 UTM	6667020	4715824	1850
Pinus	heldreichii	Montenegro	Jelovica	WGS84 UTM	6642000	4752000	1300
Populus	nigra	Morocco	Dades Valley	degree decimal	31.18	-06.00	1400-1600
Abies	alba	Poland	Józefów_224j	degree/minute/second	50°23'	23°14'	260
Abies	alba	Poland	Józefów_244f	degree/minute/second	50°23'	23°16'	300

- Database of marginal population is set up

COST European Targeted Network TN1401: *Capacity building in forest policy and governance in Western Balkan region (CAPABAL)*



Start of Action: 2/10/2014
17 countries involved

Montenegro participation in TN 1401:
since May **2015**

The Network aims to enhance the forest and natural resources policy and governance, as well as the sustainable, multifunctional forest management in the Western Balkans and across Europe

MC observer/MC Member: **Dr Milić Čurović**
University of Montenegro, Biotechnical Faculty

- participation on 1 annual meeting,
- 1 WG meeting,

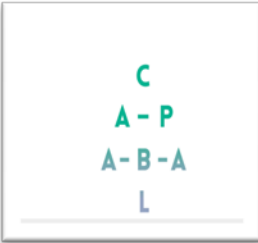
WG meeting – BOKU, Vienna 16th – 18th of September 2015

C
A - P
A - B - A
L

A	B	C	D	E	F
Forest Governance Principle	Key word (sinonim)	No	Section	Copy/Paste the Law Section	Comments
ACCOUNTABILITY	SAVJESNO (conscientiously)				
	ODGOVORNO (responsible)				
	NADLEŽNOST (responsibility, authoritative)				
	OBAVEZA (engagement, obligation)				
	IZVRŠENJE (implementation, performance, execution)				
	KAZNENE ODREDBE (penalties)				
EFFECTIVENESS	DELOTVORAN/EFEKTIVAN (effective)				
	KORISTAN (useful)				
	NA SNAZI (in power)				
	NA PRAVI NAČIN (correctly)				
EFFICIENCY	EFIKASAN/UČINKOVIT (efficient)				
	SPOSOBNO (capable)				
	USPJEŠNO (successfully, advanced)				
	PROIZVODNOST/ PRODUKTIVNOST (productivity)				
	DOBIT (profit)				
	ISKORIŠTENJE (utilisation)				
	RENTABILNOST (rentability)				
	EKONOMIČNOST (cost effective)				
FAIRNESS/EQUITY	NEPRISTRASNOST (unbiased)				
	JASNOST (clarity)				
	ISPRAVNOST (correctness)				
	PRAVEDNOST (fairness)				
	ČASNOST (honesty)				
PARTICIPATION	UČEŠĆE/ SUUDELOVANJE (participation)				
	UČESNIK/ AKTER (participant)				
	JAVNA RASPRAVA (public consultation/debate)				
	DOPRINOS/DOPRINJETI (contribution)				
	ZAINTERESOVANE STRANE-STAKEHOLDER				
TRANSPARENCY	DOSTUPNO JAVNOSTI (publicly available)				
	TRANSPARNETNOST (transparency)				
	JAVNOST (public)				
	JAVNO (publicly)				
	INFORMISANJE (informing)				
	OBLAVLJIVANJE (publishing, dissemination)				
	JAVNO GLASILO (official gazette)				

Excel form for analysis of Governance principles in Laws and Strategies

The questionnaire is created as a tool for assessing Forest Governance in selected countries of Western Balkan



I Pillar: Policy, legal, institutional and regulatory frameworks							
1.1 Forest-related policies and laws							
Importance				Implementation in your country			
1	2	3	99	1	2	3	99
Low	Medium	High	Do not know	Low	Medium	High	Do not know
Comment:				Comment:			

All results are going to be processing and will present general perspective on the issue.



Capacity Building in Forest
Policy and Governance in
Western Balkan Region
Cost TN 1401

**4RD CORE GROUP AND
3ND JOINT WG MEETING**

Podgorica, Montenegro
March 16th – 18th, 2016

C
A – P
A – B – A
L



Forests, their Products and Services (FPS)
in Montenegro

Thank you for the attention,

