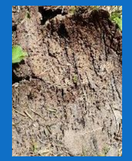
CONNECTION BETWEEN CALAMITY IN BEECH STANDS BY *Rhynchaenus fagi* L. (Coleoptera, Curculinidae), EXCESSIVE OF SPRUCE BARK BEETLES AND ENDNGERED POSSIBILITY TO PROTECT THE RARE EPIPHYTIC LICHENS: CASE STUDY THE – NP KOPAONIK MOUNTAIN IN 2024

Renata Gagić -Serdar, Miroslava MARKOVIĆ, Suzana MITROVIĆ, Ljubinko RAKONJAC, Bojan KONATAR

Institute of forestry, Kneza Višeslava 3, Belgrade, Republic of Serbia

The supplementary feeding of *Rhynchaenus fagi* (Illiger, 1798), taxa with syn. or previously included within the genus *Orchestes*, as *Orchestes fagi* (L.) or beech miner's weevil lasted much longer this season and started earlier, even to 6 weeks. Due to the exceptional abundantion of it this season and with the ever-present meteo-climatic crisis this summer, it seems that in the end, the beech trees were damaged by 4 **instead** of two, both ones – per two adult and larval generations. The assumption is that the second generation of larvae appeared, so in addition to the much earlier appearance of the first, there is also a second this year due to the almost Mediterranean climate in areas where mountain summer normally starts late (in July) and ends quickly. Ever since the adults has been active and has been receiving supplementary feeding, all the time since the start of the growing season, it has created a picture and impression that the damage caused by this pest in the year 2024 is extremely strong and visible in many areas in Serbia where beech is widespread. Everything was affected, the chain of damages occurred (linking with three spruce bark beetles high abundation on Kopaonik from previous period) and all had been intensely reflected on even lichen diversity - as an indicator of the state of the environment, in the most negative sense. This was the subject of our research and intervention this summer, some results are represent here. Here are Lichen chance to be present.

Likelihood of Lichen taxa: Chance of risk not to be proven on previous sites, 2022
Rare: Slim possibility of happening on old, impossible to locate Lichen taxa on new site
Unlikely: Could occur but remote, not with proper surface, taxa stop to reproduce
Possible: Might happen to find Lichen species, just on old sites
Likely: Expected to occur, even per one of common Lichen taxa in frame
Almost Certain: Expected regularly, Lichen taxa are wide spread and reproducing
Severity: Impact on Lichen taxa findings on previous sites
Insignificant: Not worth, just worry about loss of Lichen taxa
Minor: Can cause delays or been rare of Lichen species even in 2022
Moderate: Likely delays or lost in start of Lichen taxa
Major: Possible failure to find (not back to all known, than also rare lichen taxa)
Severe: Definite failure in even existing on Kopaonik
Risk Level: Setting Priority just not to be extinct of Lichen taxa
Low: Not much, risk is not look in proper place or mix it with specific Lichen taxa
Medium: Some risk, in determination but here is low possibility that Lichen taxa is there
High: Major risk in losing Lichen taxa species on Kopaonik
Very High: Extreme risk, like lost Lichen species forever, even in country, extinction



BARK BEETLESS ON SPRUCE BARK, Kopaonik 2024.

Table 1. Risk of appeaerance several pests with huge abundance, always is more serious in Protected Area With the strong calamity of the beech weevil miner - *Rhynchaenus fagi* L., and a large number of spruce with both types of burk **beetles** on the surface of which the larvae incubate – and it is like that for several years, it was assumed that there must be a lack of moisture in Area of NP Kopaonik – Which could lead to the luck to end for environment priceless Lichens taxa

Fig. 2,3 Signs of trees physiological weakness, the result of a stronger attack in 2024 were trio of this pests - *Pitiogenes chalcographus* (L.), *Ips typographus* (L.), and *Xyloterus lineatus* (L.). Their supression was done by feromone trap and feromones (IT Ecolure, PC Ecolure i XL Ecolure). One of those signs - of attack of „Trio of Bark beetles"on high trees of spruce is usually occurence of fungus *Chrysomixa abietis* (Wallr.) Unger, also appears on needles (Orig.)

Level of protection of the sampled sites B4:E	Species	Commonness Rarity	Indicator value
Non-Protected Areas (NPA)	*Xanthoria parietina*	EC	0.745**
	Phaeophyscia orbicularis	EC	0.586**
	Hyperphyscia adglutinata	EC	0.584**
	Physconia grisea	C	0.563*
	Evernia prunastri	VR	0.464**
	Lecidella elaochroma	RC	0.397*
	Lecanora argentata	C	0.343*
	Physcia stellaris.	VC	0.343*
Protected Areas (PA)	*Lecanora sp.*	RR	0.730***
	Candelariella xanthostigma	VC	0.546*
	Phaeophyscia orbicularis	C	0.543**
	Candelariel laaurella	VR	0.540**
	Buelia punctata	C	0.531*
	Physcia tenella	ER (extintct)	0.524**
	Ochrolechia pallescens	VR	0.456*

Physcia tenella -an extinct species

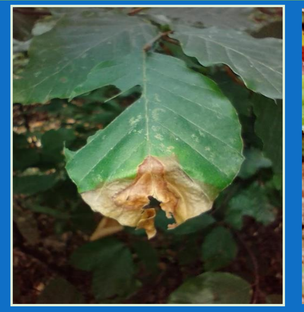
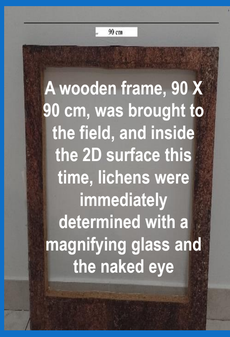


Fig. 1, 2 The strength of the attack for *Rhynchaenus fagi* l. is determined by taking 5 branches each about 1 m long from three levels in the crown of the high forest. All of them are counted, then only the leaves with mines counts. In percentage (%) of leaves with mines are present or it is the **share** of attack strength (this year it was from 50 to even 80 %). It usually lasts 3+ or 4 years in a row. Then the tall (because it chooses the best) forests stagnate, and lose their safe and otherwise most important guaranteed share in growth and yield, they never even regain the same height-thickness status. Even - they couse to be the trees of the future, even though they have been that through out their whole lives - insects of one mm. There is no experience with control outside the nursery, which may be wrong and is also the goal of this paper (Orig).



Very sensitive lichen taxa are comfired as : *Candelariel laaurella, Evernia prunastri, Lecanora* sp., *Ochrolechia pallescens* and *Parmelia sulcata*, but without *Physcia tenella* on naither one of 16 f

Table 3. Indicator species in relation to the level of protection of the sampled sites (Protected Areas and Non-Protected Areas) in the study area of Kopaonik (Protected and non-protected areas). Indicator values, (qxF) derived from Indicator Species Analysis (Dufrêne & Legendre, 1997), range from 0 (no indication) to 1 (maximum indication). EC= extremely common, VC= very common, RC= rather common, C= common, R= rare, RR= rather rare, VR= very rare, ER= extremely rare.

- Sensitive lichen taxa are: *Buelia punctata*, *Lecanora argentata*, *L. intumescens*, *L. **pulicars***, *Lecidella elaochroma* and *Physcia stellaris*.
- Tolerant lichen taxa are: *Phaeophyscia orbicularis*, *Physcia adscendens*, *Candelaria xanthostigma*, *Physconia distorta*, *Physconia grisea* and *Xanthoria*