



## ZBORNIK APSTRAKATA

V NAUČNO-STRUČNI SIMPOZIJUM  
SA MEĐUNARODNIM UČEŠĆEM  
**„PIVO, PIVARSKE SIROVINE I  
OPREMA“**

Zrenjanin, Srbija  
25 - 28.10.2022. godine  
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**„PIVO, PIVARSKJE SIROVINE I OPREMA“**

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WITH INTERNATIONAL PARTICIPATION  
**"BEER, BREWING RAW MATERIALS AND  
EQUIPMENT"**

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# IZAZOVI KONTROLE RAMULARIOZNE PEGAVOSTI JEČMA

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Ramulariozna pegavost ječma je prvi put prepoznata u Evropi kao ekonomski značajno oboljenje tek 80-ih godina XX veka, iako je opisana u Italiji još 1889. Prouzrokovatelj ramulariozne pegavosti ječma je gljiva *Ramularia collo-cygni* koja je dobila naziv na osnovu izgleda konidiofora koji podsećaju na vrat labuda. *Ramularia collo-cygni* je opisana kao ekonomski značajan patogen još u Novom Zelandu, Argentini i istočnoj i zapadnoj obali Kanade. dovodeći do gubitaka prinosa i do 35 %. *Ramularia collo-cygni* se prvenstveno prenosi semenom, mada sekundarni izvor infekcije mogu činiti i spore koje se šire vazdušnim strujama. *Ramularia collo-cygni* je endofitna gljiva, i u uslovima stresa biljke dobija patogene svojstva produkcijom rubelina (A–E) od čega rubelini B i D dovode do razaranja membrane i nekroze tkiva domačina. S obzirom da je *Ramularia collo-cygni* prouzrokovatelj relativno novog oboljenja i da testiranje semena ječma u prometu nije vršeno na njeno prisustvo, postoji rizik širenja ove bolesti na područja u kojima nije bila prisutna. Prvi simptomi ramulariozne pegavosti ječma u Srbiji primećeni su u nešto slabijem intenzitetu 2008. i 2009. godine na lokalitetu Rimski Šančevi, dok je prva jača pojava na sortama ozimog ječma zabeležena i opisana od strane Jevtića i sar. (2016) na više lokaliteta u Srbiji proizvodne 2015/2016. Imajući u vidu da pravovremena determinacija, određivanje otpornosti gajenog sortimenta i mere zaštite predstavljaju pravi izazov u kontroli ovog patogena, detaljna istraživanja koja se bave ovim aspektima pokrenuta su i u našoj zemlji. Ispitivanja mogućnosti determinacije *Ramularia collo-cygni* u različitim fenofazama ječma ukazala su da vizuelna determinacija zahteva visok nivo ekspertize ocenjivača. Nepreciznost u određivanju nivoa zaraze klasičnim vizuelnim putem može se javiti usled maskiranja simptoma sa simptomima koje stvaraju drugi patogeni kao što su: *Pyrenophora teres* f.sp. *maculata* (tačkasti tip) ili *Cochliobolus sativus*. Utvrđeno je da je primena molekularnih tehnika neophodan korak u povećanju preciznosti određivanja prisustva ovog patogena, pogotovo u ranim fazama razvoja ječma, kada je i jedina moguća. Dosadašnja istraživanja ukazala su da je primena fungicidnih tretmana za suzbijanje ramulariozne pegavosti optimalna u fenofazama GS45-49, međutim udeo abiotičkog i biotičkog streasa u konačnim gubicima prinosa tek se moraju ispitati kako bi se ispoštovali principi integralne zaštite i održive proizvodnje ječma.

**Ključne reči:** *Ramularia collo-cygni*, značaj, fenofaza, suzbijanje

## CHALLENGES IN RAMULARIA LEAF SPOT CONTROL

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Ramularia leaf spot of barley was not recognized in Europe as an economically significant disease until the 80s of XX, although the causal agent *Ramularia collo-cygni* was identified as early as 1889 in Italy. The name of *Ramularia collo-cygni* is derived from the special swan neck shape of the conidiophores. *Ramularia collo-cygni* has been described as an economically significant pathogen in New Zealand, Argentina, and Canada causing yield losses of up to 35%. It is primarily considered a seed-borne pathogen, although it could also be transmitted as air-borne conidia. *Ramularia collo-cygni* is known as an endophytic fungus, but under conditions of plant stress, it gets pathogenic properties by producing rubellins (A – E), of which rubellins B and D lead to membrane destruction and host tissue necrosis. Given that *Ramularia collo-cygni* is the causal agent of a relatively new disease, and that testing of seed for the presence of *Ramularia collo-cygni* is not required as a statutory seed test, there is a risk of disease spreading in the areas where it was not present. The first symptoms of Ramularia leaf spot in Serbia were observed in 2008 and 2009 at the locality Rimski šančevi, leading to more prominent occurrences in several locations in Serbia during the 2015/2016 growing season. Bearing in mind that timely identification of the pathogen, testing for barely resistance and decisions on fungicide application is challenging, we addressed all these issues in our investigations. Testing the efficacy of methods for the determination of Ramularia leaf spot in plant tissue in different phenological phases of barley, indicated that *Ramularia collo-cygni*-driven symptoms could be masked by other pathogens such as *Pyrenophora teres* f.sp. *maculata* and *Cochliobolus sativus*. It was also indicated that the application of molecular techniques in the identification of *Ramularia collo-cygni* is a necessary step in increasing the precision of disease determination, especially in the early stages of barley development. Previous investigations have shown that the application of fungicides in the control of Ramularia leaf spot is optimal in the GS45-49 phenological phases, however, the share of abiotic and biotic stress in the final yield losses has yet to be examined in order to comply with the principles of integrated plant protection and sustainable barley production.

**Key words:** *Ramularia collo-cygni*, significance, fenological phase, control

