PTEP 2022 PTEP 2022

ZBORNIK IZVODA

XXXIV NACIONALNA KONFERENCIJA
PROCESNA TEHNIKA I ENERGETIKA U POLJOPRIVREDI
PTEP 2022
03-08. april, 2022.
SOKOBANJA
HOTEL “MORAVICA”, SRBIJA

BELI LUK U ORGANSKOJ PROIZVODNJI I ENDOPARAZITNA NEMATODA DITYLENCHUS DIPSACI

Violeta ORO[1], Rade STANISAVLJEVIĆ[1], Marijenka TABAKOVIĆ[2], Dragoslav ĐOKIĆ[3]
[1]Institut za zaštitu bilja i životnu sredinu, 11000 Beograd, Teodora Drajzera 9, Srbija
[2]Institut za kukuruz „Zemun Polje“, 11185 Beograd-Zemun, Slobodana Bajića 1, Srbija
[3]Univerzitet u Nišu, Poljoprivredni fakultet u Kruševcu, 37000 Kruševac, Kosančićeva 4, Srbija
E-mail: viooro@yahoo.com

Beli luk je prehrambena namirnica koja je od davnina korišćena u prevenciji i lečenju različitih bolesti bakterijskog, gljivičnog i virusnog porekla i bez štetnih efekata. U starom Egiptu su beli luk davali radnicima koji su gradili piramide povećavajući na taj način njihovu izdržljivost a u staroj Grčkoj je bio hrana atletičara na Olimpijskim igrama. U Kineskoj medicini je prepisivan kao sredstvo koje pomaže u disanju i varenju, posebno za dijareju i protiv crevnih parazita. U Indiji se pre 2.000 godina koristio za lečenje srčanih bolesti i artritisa a u Engleskoj u srednjem veku je korišćen za lečenje različitih bolesti poput opstipacije, zubobolje, edema, ujeda životinja i kuge. Njegova popularnost, u tom smislu, nije ni do danas opala, štaviše brojna istraživanja dokazuju mnoge korisne osobine ove namirnice koja služi kao hrana ali i kao lek.

Proizvodnja belog luka u našoj zemlji se obavlja setvom odn. sađenjem češnjeva (ručno ili mašinski) u jesen ili u proleće na površini oko 9 000 ha. Proizvođači treba da koriste sertifikovan sadni materijal jer u protivnom može da se desi da češnjevi budu zaraženi endoparazitnom nematodom *Ditylenchus dipsaci* (Kühn) Filipjev, koja je jedna od najštetnijih nematoda jer dovodi do totalnog propadanja glavica i kompletnog gubitka prinosa. Ova nematoda je izraziti polifag, javlja se i na semenu lucerke, pasulja, deteline itd. ali i na 450 drugih domaćina gajenih biljaka i korova. U proleće, na mladom luku infekcija može da bude asimptomatska, ali kako životni ciklus traje samo 20 dana a svaka ženka može da položi i do 500 jaja, intenzivnim razmnožavanjem ubrzano raste brojnost nematoda. Simptomi se uočavaju na lukovicama odn. češnjevima u vidu braon pega koje se spajaju i zahvataju celo tkivo uz degradaciju srednje lamele ćelijskog zida i dovode do totalnog propadanja lukovica pri čemu se pojavljuje intenzivan i neprijatan miris. Nematoda može da opstane godinama u suvom materijalu a opstaje i na velikom broju korova, pa se teško može iskoreniti. Poseban problem je u organskoj proizvodnji jer nema efikasnih bio-pesticida tako da su profilaktičke mere od esencijalnog značaja. Pojava *D. dipsaci* je do sada utvrđena kod dva proizvođača iz okoline Beograda.

Da bi se utvrdilo genetičko srodstvo odn. moguće poreklo ovih izuzetno štetnih nematoda koriste se molekularne metode koje uz pomoć PCR (Lančane Reakcije Polimeraze), sekvenci i odgovarajućih kompjuterskih programa porede genetičku sličnost naših i stranih populacija. Molekularnim metodama je utvrđeno da je najbliži srodnik naših populacija ove nematode populacija iz Kine, što ukazuje da je mogao biti korišćen sadni materijal belog luka uvezen iz Kine. Novija istraživanja u Evropi su potvrdila prisustvo još opasnije nematode *D. gigas* koja je za sada otkrivena samo u Poljskoj na semenu boba.

Ključne reči: beli luk, organska proizvodnja, nematoda, endoparazit

GARLIC IN ORGANIC PRODUCTION AND ENDOPARASITIC NEMATODE DITYLENCHUS DIPSACI

Violeta ORO[1], Rade STANISAVLJEVIĆ[1], Marijenka TABAKOVIĆ[2], Dragoslav ĐOKIĆ[3]
[1]Institute for Plant Protection and Environment, 11000 Belgrade, Teodora Drajzera 9, Serbia
[2] Maize Research Institute „Zemun Polje“, 11185 Belgrade-Zemun, Slobodana Bajića 1, Serbia
[3]University of Nis, Faculty of Agriculture in Krusevac, 37000 Kruševac, Kosančićeva 4, Serbia
E-mail: viooro@yahoo.com

Garlic is a food that has long been used in the prevention and treatment of various diseases of bacterial, fungal and viral origin and without harmful effects. In ancient Egypt, garlic was given to workers who built pyramids, thus increasing their endurance, and in ancient Greece, it was the food of athletes at the Olympic Games. In Chinese medicine, it was prescribed as an agent that helps with breathing and digestion, especially for diarrhea and against intestinal parasites. It was used 2,000 years ago in India to treat heart diseases and arthritis, and in the Middle Ages in England the garlic was applied to treat various ailments such as constipation, toothache, oedema, animal bites and plague. Its popularity, in that sense, has not declined to this day, moreover, numerous researches prove many useful properties of garlic, which serves as food but also as a medicine.

Garlic production in our country is done by sowing i.e., by planting cloves (by hand or by machine) in autumn or spring on an area of about 9,000 ha. Producers should use certified planting material, otherwise the cloves may be infected with the endoparasitic nematode *Ditylenchus dipsaci* (Kühn) Filipjev, which is one of the most harmful nematodes because it leads to total bulb decay and yield loss. This nematode is a typical polyphagous organism, it may occure on alfalfa seeds, beans, clover, etc., but also on 450 other hosts of cultivated plants and weeds. In the spring, the infection on young plants may be asymptomatic, but as the life cycle lasts only 20 days and each female can lay up to 500 eggs, the number of nematodes increases rapidly. Symptoms are observed on the bulbs or cloves in the form of brown spots that merge and capture the entire tissue followed by the degradation of the middle lamella of the cell wall and lead to the total decay of the bulbs, whereby an intense and unpleasant odor appears. The nematode can survive for years in dry material and on a large number of weeds, and it can hardly be eradicated. The nematode is a special problem in organic production because of a lack of effective bio-pesticides, so prophylactic measures are essential. The occurrence of *D. dipsaci* has been observed so far in two farms from the Belgrade area.

In order to determine the genetic relationship i.e., possible origin of these extremely harmful nematodes, molecular methods were used which, with the help of PCR (Polymerase Chain Reaction), sequences, and appropriate computer programs, compare the genetic similarity of our and foreign populations. Molecular methods have shown that the closest relative of our populations of this nematode is the population from China, which indicates that the garlic planting material may be imported from China. Recent research in Europe has confirmed the presence of the even more dangerous nematode *D. gigas*, which has only been detected in Poland in the faba bean seeds.

Key words: garlic, organic production, nematode, endoparasite