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VPELJAVA LASTNOSTI ODPORNOSTI PROTI VAROJAM V LOKALNI REJSKI PROGRAM ZA *Apis mellifera ligustica*

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Izvleček

Vzreja čebeljih matic ima v Italiji, še posebno pa v deželi Emilija – Romanja, dolgoletno tradicijo. Lastnosti, pomembne za odpornost na varoje, običajno niso bile upoštevane pri odbiri in testiranju družin. Projekt se je začel leta 2014 s čebeljimi družinami lokalnih vzrejevalcev. Lastnosti, pomembne pri odpornosti na varojo so čistilno vedenje (ocenjevano s »pin-testom«), obremenjenost z varojo (naravni odpad varoj in število varoj na odraslih čebelah) ter zaviranje razmnoževanja pršic (SMR; primerjava razvojnega stanja potomstva varoj glede na razvojno stanje bube). Pri odbiri smo upoštevali že uveljavljene lastnosti, kot sta medonosnost in mirnost. Parjenje je nadzorovano na plemenilni postaji, vzpostavljeni za ta namen v gorski dolini. Od leta 2015 vzredimo po 100 matic vsako leto. Pred parjenjem zagotovimo, da so matičarji in trotarji rasno čiste družine *Apis mellifeera ligustica*. Plemenske vrednosti, ocenjene z BLUP modelom (www.beebreed.eu), kažejo izboljšanje odpornosti na varojo od generacije P (starševska generacija; PV = 99.8%; N=30) do F2 generacije (PV = 102.3; N=39). V najboljših družinah smo ocenili lastnost zaviranja razmnoževanja pršic po protokolu RNSBB (Research Network for Sustainable Bee Breeding). V 24 družinah (11 v 2016 in 13 v 2017) smo pregledali 5362 celic. Rezultati so bili zelo variabilni, povprečni odstotek pršic, ki se niso razmnoževale, je bil 45 % (21 % min, 84 % maks) v 2016 in 51 % (25 % min in 81 % maks) v letu 2017. Naša raziskava je pokazala, da sta SMR in čistilno vedenje v pozitivni korelaciji, s čimer smo potrdili prejšnje študije. Ponovno pokrivanje zalege je bilo pogostejše v napadenih celicah (33 %) kot v nenapadenih celicah (14 %), medtem ko odnos med SMR in ponovnim pokrivanjem zalege ni izrazit. Na delavnicah v projektu sodelujejo lokalni vzrejevalci, ki iz družin z najboljšo čistilno sposobnostjo vzrejajo mlade matice in jih prašijo na plemenilni postaji. S tem prispevajo k širjenju izboljšane odpornosti proti varojam v lokalnem okolju.

Ključne besede: *Varroa destructor*, odpornost na varoje, vzreja matic, zaviranje razmnoževanja pršic

INTRODUCING MEASUREMENT OF VARROA RESISTANCE TRAITS IN A LOCAL BREEDING PROGRAMME FOR *Apis mellifera ligustica*

Abstract

Italy and especially the region Emilia Romagna have a long tradition in honey bee queen breeding. Traits for varroa resistance however are not routinely included in the testing and selection activities. The aim of this project was thus to introduce testing for varroa resistance traits in colony evaluation procedures. The project started in 2014 with stock from local queen breeders. Traits for varroa resistance are hygienic behaviour (measured with the Pin Test), varroa infestation levels (natural mite fall and infestation rate on adult bees) and suppression of mite reproduction (measured by analysing varroa progeny stage relative to honey bee pupa development). Traditional traits, honey production and gentleness are also considered. To ensure controlled mating between selected queens and drones, a mating station was established in a mountain valley. Starting in 2015, on average of 100 queen bees have been produced each year. Before reproduction, the selected colonies are analysed to ascertain they correspond to the autochthonous subspecies *Apis mellifera ligustica*. Breeding values calculated with BLUP Animal Model (on www.beebreed.eu) show an increase in Varroa Resistance from the P generation (BV= 99.8 %; N=30) to F2 (BV=102.3

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%; N= 39). The best colonies have been analysed for screening of the suppression of mite reproduction trait (SMR), using the protocol developed by the Research Network for Sustainable Bee Breeding. A total of 5362 capped cells from 24 colonies were analysed, 11 in 2016 and 13 in 2017. A great variability was found, with average non-reproduction rate 45% (21% min, 84% max) in 2016 and 51% (25% min, 81% max) in 2017. Confirming previous studies, SMR was found to be positively correlated to hygienic behaviour. The recapping behaviour was also observed and found to be higher in infested cells (33%) than in non-infested cells (14%), while its relation to SMR was not so clear. Local beekeepers are being involved with training events, and their most hygienic colonies are used for production of virgin queens which are mated in the isolated station and then used in their operations, thus contributing to distribution of the resistance traits in the local environment.

Key words: *Varroa destructor*, varroa resistance traits, queen breeding, suppression of mite reproduction