

Fertility, longevity, oviposition dynamic and sex-ratio of *Scaphoideus titanus* Ball.

Mauro Jermini¹, Romina Morisoli¹, Ivo E. Rigamonti², Paola Girgenti², Valerio Mazzoni³

1 Agroscope Cadenazzo, Via A Ramél 18, CH-6594 Cadenazzo, Switzerland. 2 Dipartimento di Scienze per gli Alimenti, la Nutrizione e l'Ambiente (DeFENS), Università degli Studi di Milano, Via Celoria 2, I-20133 Milano, Italy. 3 Fondazione Edmund Mach, Via E. Mach 1, 38010 S. Michele all'Adige (TN), Italy.

Abstract; The Nearctic leafhopper, *Scaphoideus titanus* Ball (Hemiptera: Cicadellidae), was accidentally introduced into Europe and has become a vector of 'Candidatus *Phytoplasma vitis*' which causes "Flavescence dorée" disease of grapevine.

To increase the efficiency of *S. titanus* control, a phenology model was developed to simulate the successive occurrences of egg hatching, nymphal instars and adult emergence (Rigamonti *et al.* 2011). This model is a useful tool for adaptive management of vineyard populations and was extended to a multiannual infestation pattern model that could be used for strategic purposes, policy design and research work (Rigamonti *et al.*, 2013).

In field application, the model requires the quantification of various biological parameters of *S. titanus* to estimate the population density. These parameters include fecundity rate, the oviposition dynamic and the longevity of females. A field study was undertaken during two years with the aim to quantify the number of eggs contained in the abdomen of females collected using two different methods, yellow sticky traps and frapping. The sex ratio analysis confirmed the protandry of *S. titanus* independently of the sampling technique although the percentage of males was higher for a longer time on the yellow sticky traps placed horizontally inside the vine canopy. On average, 7.6±1.5 eggs/female were found between July and October 2012 and 8.6±1.51 eggs/female during the same period in 2013. At the beginning of the adult emergence, more than 98% of the females did not have eggs and this percentage decreased regularly and rapidly during the first three weeks after emergence began and remained between 0% and a maximum of 13% until October. The number of eggs showed an important variability, but most females had between 6 and 10 eggs. To explain the dynamic observed in the field, a second study was conducted in the lab, in cages at a constant temperature of 23°C. The aim was to quantify female longevity and oviposition duration and rate. The results confirmed that the females began oviposition on average only 8±2 days after mating and their longevity was in average 61±24 days. During this time, the oviposition was in average of 37.6±23.3 eggs/female and the dead females contained in average of 13±6 eggs. These preliminary results indicate that the data reported in the literature underestimated both the real oviposition potentiality of the females and their longevity. Thus, it seems necessary to undertake a specific study to quantify these parameters at different temperatures.

Key words: egg, female, protandry, oviposition

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