



SONOFAR FORMULATION COLOPOINT
RED SPIDER (*Tetranychus urticae* (Koch) (HOT: TETRANYCHIDAE) TOXIC
EFFECT OVER LAB TEST RESULTS REPORT

1. MATERIALS AND METHODS USED IN TESTS

1.1 Material

1.1.1 Trial Area

These test studies were carried out in 2020 in the climate room belonging to Bursa Uludağ University Faculty of Agriculture, Plant Protection Department, Prof. Dr. Necati Baykal Toxicology and Acarology Laboratory and Plant Protection Department (Figure 1).



Figure 1. The climate chamber where the test studies were carried out.

1.1.1. Plants used in experiments

In this test, the test material is the plant species that the red spider causes the most damage to. 10-week-old seedlings of eggplant (Pala variety) [*Solanum melongena* L.(Solanaceae)] plants used. seedlings artificial illuminated (16 hour bright: 8 hour darkness) $27^{\circ}\text{C}\pm 1$ And $60\pm 5\%$ proportional moist sterile climate room conditions from seed bred (Shape 2).



Figure 2. Eggplant plants where the tests were carried out.

1.1.2. Mite culture

Two-spotted spider mite (*Tetranychus urticae* Koch) (Acari: Tetranychidae) individuals used in the experiment were taken from a sensitive population collected in Bursa 8 years ago and grown continuously without pesticides. Colonies of the pest were propagated on the same eggplant seedlings under controlled conditions (Figure 3).



Figure 3. Red spider individuals on which the tests were performed.

1.1.3. Sonofar liposome formulations

In these tests, a Sonofar brand nanotechnology product solution in different formulations and concentrations, delivered to us by Sonofarma company, was used. In the first trial, two different concentrations (I and II) of two different formulations (N and S) were used. In the second trial, combined formulations were tried in which different concentrations of (S+AA), (S+P), (S+K) or (S+L) were mixed into concentration I of the S-coded formulation (Figure). 4).



Shape 4. An image from the testing phase where Sonofar's formulations were used.

2. Method

1.2.1. Toxic effect tests on potted seedlings

The same volume of solutions was sprayed on and under the leaves of eggplant seedlings using hand sprayers. As a control group, one group was sprayed with only water. Then, the plants were kept under laboratory conditions for 30 minutes to dry the water and solutions applied to the leaves. 5 adult females (according to the economic damage threshold determined for eggplant) were placed one by one on each leaf with the help of a brush. The experiments were conducted in 3 replicates. The plants were kept in sterile climate room conditions with artificial lighting (16 hours of light: 8 hours of darkness), $27^{\circ}\text{C}\pm 1$ and $60\pm 5\%$ relative humidity for 7 days. At the end of the third and 7th days, the living biological stages of the red spider (egg, larva, nymph, adult) were counted and noted one by one under a stereomicroscope.

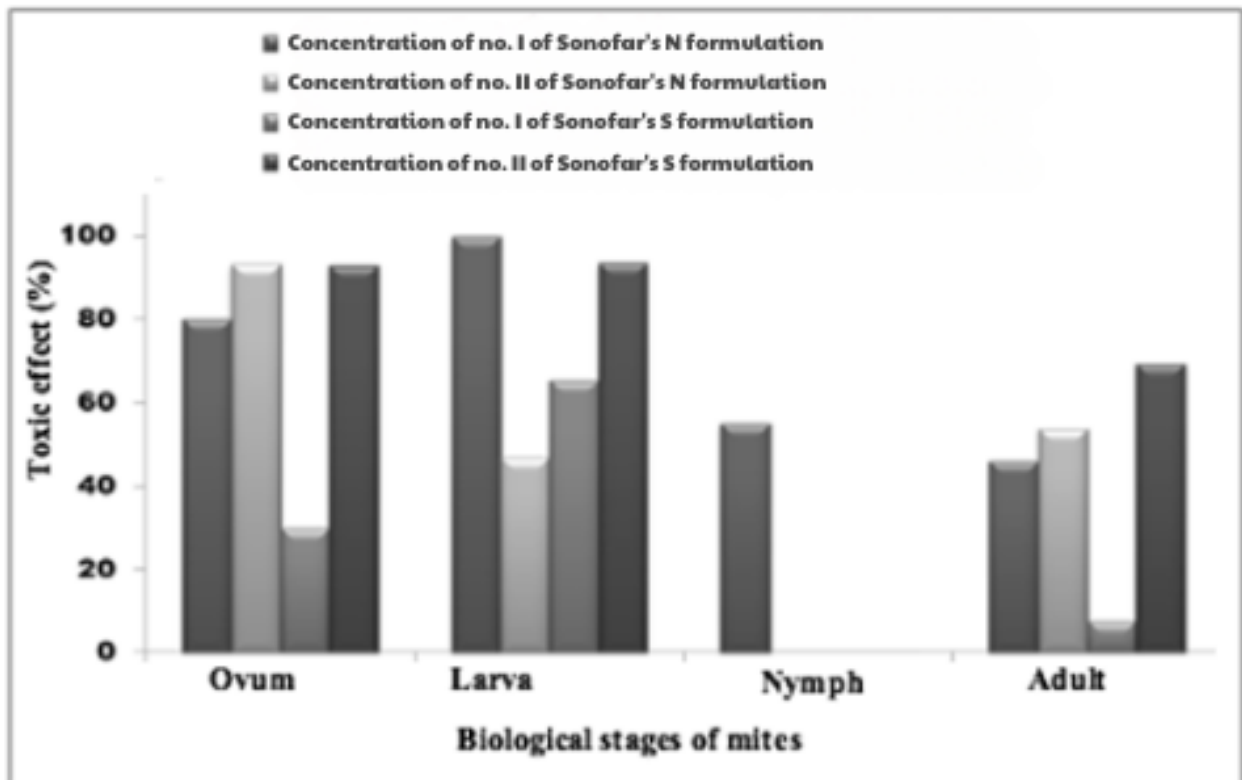
1.2.2. Evaluation of test results

The numbers of live red spiders seen on eggplant plants in the control group where only water was applied and the numbers of live individuals on eggplant leaves to which different formulations were applied were placed in the Abbott formula (Abbott 1925). The results obtained are presented in graphs as a percentage of the actual biological effect.

2. TEST RESULTS

2.1 Effect of two different formulations of Sonofar

According to the results of the 3rd day of the tests carried out under laboratory conditions, the concentrations of N formulation I and II affected the eggs at a rate of 80 and 93%, respectively; 100 and 47% to larvae; It showed a toxic effect of 55 and 0% on nymphs and 46 and 53% on adults. The same concentrations of the S formulation were applied to eggs at a rate of 30% and 93%, respectively; 66 and 94% to larvae; It showed a toxic effect of 0 and 0% on nymphs and 8 and 69% on adults (Figure 5).



Shape 5. Toxic effects of Sonofar's N and S coded formulations, concentrations I and II, on different biological stages of the Two-spotted red spider, 3 days after application.

According to the 7th day results of the tests carried out under laboratory conditions, the concentrations of N formulation I and II affected the eggs at a rate of 46 and 73%, respectively; 23 and 60% to larvae; It showed a toxic effect of 68 and 95% on nymphs and 14 and 71% on adults. The same concentrations of the S formulation were applied to eggs at 5% and 0%, respectively; 0 and 30% to larvae; 76 and 19% toxic effects on nymphs and 15 and 29% on adults showed (Figure 6).

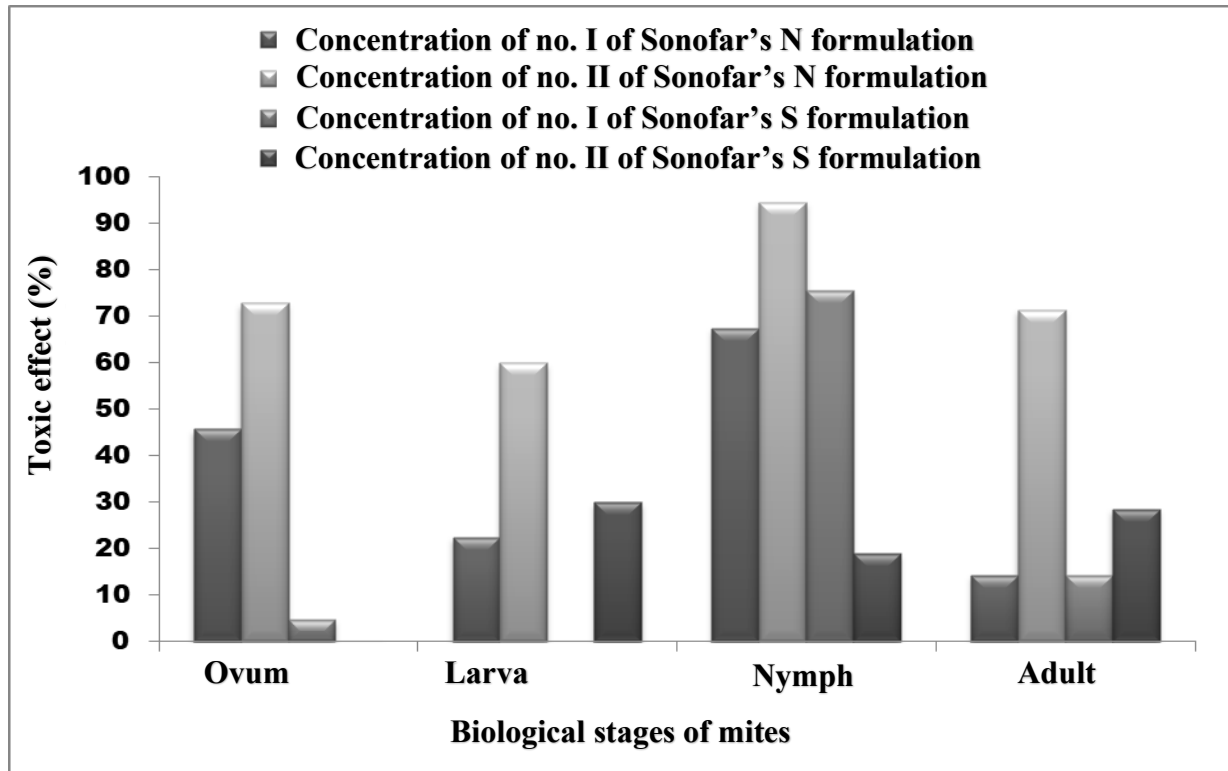


Figure 6. Toxic effects of concentrations I and II of Sonofar's N and S formulations on different biological stages of the Two-spotted red spider 7 days after application.

2.2. Effect of Sonofar formulations combined with vegetable oils

According to the results of the 3rd day of the tests carried out under laboratory conditions, the concentration of 1000 mg/L of the single formulation combined with (S+K), (S+L), (S+P) and (S+AA) The formulations in which it is applied are applied to eggs at a rate of 97, 99, 99 and 100%, respectively; larvae at 95, 100, 100 and 100%; It showed a toxic effect on nymphs at a rate of 0% and on adults at a rate of 100, 100, 100 and 100% (Figure 7).

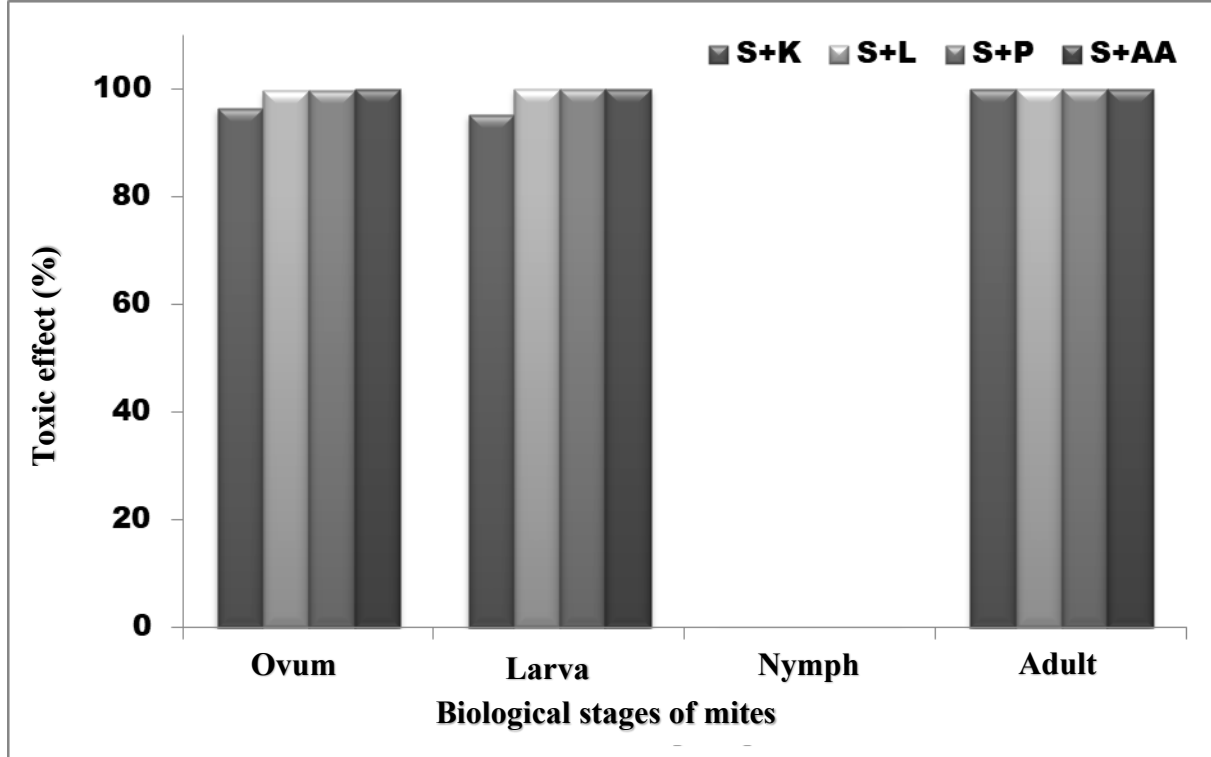


Figure 7. Toxic effects of Sonofar S formulation concentration I (S+K), (S+L), (S+P) and (S+AA) mixtures on different biological stages of the Two-spotted red spider 3 days after application.

2. CONCLUSION

According to the test results carried out on eggplant plants under laboratory conditions, if Sonofar containing a nanotechnology solution is sprayed on eggplant leaves alone in different formulations and concentrations, after three days, the eggs and larvae of the Two-spotted red spider are destroyed by 30-93% and 47-100%, respectively; adults

It killed 8-69%. Since nymphs did not appear in the first 3 days, the results were not taken into account. On the 7th day of testing, the effects were between 19-76% as nymph populations increased naturally. Accordingly, different formulations and concentrations of Sonofar showed varying degrees of toxic effects on all biological stages of the red spider. For best results, 93% of eggs, 100% of larvae, nymphs

Lethality (toxicity) has been observed in up to 76% of adults and 69% of adults. The combinations created to increase the effectiveness of Sonofar significantly increased the toxic effect on the red spider and showed a synergistic effect. Even the lowest concentration of Sonofar (concentration no. I)



These mixtures, when combined, hatch into eggs within 3 days.

97-100%, 95-100% to larvae; It showed a 100% toxic effect on adults. Since these mixtures showed a rapid effect within 3 days, they caused a very high death rate of red spider individuals without allowing the formation of nymphs. As a result, depending on different formulations and concentrations of Sonofar, it showed a toxic (poison) effect on the two-spotted red spider. These formulations have the potential to be used as Plant Protection Products in the Crop Production stages in Agriculture in the future.02.07.2020

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I Confirm the Accuracy of the Above Information.

DEAN

Prof. Dr. İlhan TURGUT

I certify that this report was prepared by the faculty member whose name, surname and title are written above.