List of Contents

6. Summary

Two types of inactivated PPR vaccine where prepared and evaluated, the first one adjuvanted with Nigella sativa oil and the second with mineral oil. Both types of vaccines where compared with the routinely produced live attenuated PPR vaccine. Each vaccine was prepared by mixing the aqueous phase to the oil phase and the PPRV in the aqueous phase was concentrated to 50 % of its original volume then inactivated by using BEI for 4 hours.

All vaccines where injected in sheep aged from (1-2) years and sera of these sheep were tested with Competitive ELISA, Virus neutralization test and Solid phase ELISA for determining the PPRV elevated antibodies.

For evaluating the Nigella sativa oil PPR vaccine, three doses with different ratios of aqueous to oil phases where tested {1, 2 and 3ml of (1:1), (1:2) and (1:3)} by Competitive ELISA, Virus neutralization test.

From these results, it was very clear that using 3ml of the prepared PPR vaccine with a ratio (1:1) is considered the best dose for elevating higher PPRV antibodies. It gave **25.4**, **80.6**, **101.6** and **101.6** at 7, 14, 21, 28 and 35 days post vaccination respectively. While it was **20.16**,

40.3, **40.3**, **40.3** and **40.3** with the same dose in a ratio (1:2) at 7, 14, 21, 28 and 35 days post vaccination respectively and **16**, **32**, **32**, **32** and **32**, with a ratio (1:3) at 7, 14, 21, 28 and 35 days post vaccination respectively.

These results were confirmed by Competitive ELISA where 3ml of the prepared PPR vaccine with a ratio (1:1) was considered the best dose for elevating higher percentage of inhibition (PI). It gave **(61.75**, **74.09**, **78.55**, **79.1** and **79.09)** at 7, 14, 21, 28 and 35 days post vaccination respectively. While it was **(58.5**, **65.95**, **66.22**, **66.99** and **66.3)** with the same dose in a ratio (1:2) at 7, 14, 21, 28 and 35 days post vaccination respectively and **(55.17**, **63.82**, **64.32**, **63.76** and **63.63)** with a ratio (1:3) at 7, 14, 21, 28 and 35 days post vaccination respectively.

Concerning the vaccine evaluation by Competitive ELISA, Its clearly that live attenuated PPRV vaccine was more efficient than Nigella sativa oil PPR vaccine as it induced percentage of inhibition (PI) **75.30** at 60^{th} weeks post vaccination while Nigella sativa oil PPR vaccine showed (PI) **50.40** at 52^{nd} weeks post vaccination and mineral oil PPR vaccine gave (PI) **54.20** at 24^{th} weeks post vaccination.

The efficacy of the prepared PPR vaccines were evaluated by using VNT .The obtained results revealed that the G.M. of neutralizing antibody titers used by Nigella sativa oil PPR vaccine was **(12.69)** at 52nd week post vaccination, while it was **(16** and **0)** at 24th and 32nd week post vaccination in case of mineral oil PPR vaccine. In contrast life attenuated PPR vaccine was extended with higher titers **(80.63)** for 60 Th week post vaccination.

On comparing Nigella sativa oil PPR vaccine with life attenuated PPR vaccine using indirect ELISA, the life attenuated PPR vaccine gave higher O.D. than that obtained by Nigella sativa oil PPR vaccine and extend for 60th week post vaccination **(0.950)** while Nigella sativa oil PPR vaccine gave **(0.320)** at 52nd week post vaccination and whereas it was at 24th week post vaccination with mineral oil PPR vaccine.

Interferon elicited in vaccinated animals by using the different prepared three PPR vaccines at days 3, 5, 7, 10, and 14 day post vaccination were assayed. Life attenuated PPR vaccine induced higher interferon titer at 3rd day post vaccination **(128)** while Nigella sativa oil PPR vaccine reached the peak at 5th day post vaccination **(32)**. While mineral oil PPR vaccine reached the peak **(8)** at the 5th day post vaccination.

The obtained results of Lymphocyte blastogenesis by using Nigella sativa oil PPR vaccine were {**1.830, 1.630, 1.290, 1.010 and 1.020**} at 3, 5, 7 and 14 days post vaccination respectively where those obtained by mineral oil PPR vaccine were {**1.410, 1.300, 1.290, 1.010 and 1.020**} at 3, 5, 7 and 14 days post vaccination respectively. From the previously mentioned results, it was very clear that the obtained results of Lymphocyte blastogenesis by using Nigella sativa oil PPR vaccine more higher than that elicited by using mineral oil PPR vaccine.

The physical properties of these formulations were proven acceptable in terms of emulsion stability and viscosity. Stability duration at 4^0 C was found to be 6 months for inactivated Nigella Sativa oil PPRV vaccine while it was 4 months for the prepared vaccine adjuvanted with mineral oil.

7. Conclusions

From the obtained results we can conclude that:

1-The Nigella sativa oil inactivated PPR vaccine is most potent and immunogenic than mineral oil PPR vaccine.

2-The best dose of Nigella sativa oil inactivated PPR vaccine was 3ml with a ratio (1:1) aqueous phase to oil phase.

3-Nigella sativa oil inactivated PPR vaccine induced satisfactory antibody titers extended to 13 months post vaccination while mineral oil PPR vaccine elicited low level of antibody titers remained for only 6 months.

4-Nigella sativa oil inactivated PPR vaccine had the ability to release interferon to a higher level than mineral oil PPR vaccine and extended for 10 days post vaccination while mineral oil PPR vaccine induce low level that didn't extend more than 5 days post vaccination. The interferon produced by Nigella sativa oil PPR vaccine increased gradually and decreased slowly while those induced by life attenuated PPR vaccine increased abruptly and decreased rapidly.

5-The Nigella sativa oil have the ability to proliferate lymphocyte blastogenesis with a higher ratios other than mineral oil PPR vaccine but with a lower extent than induced by live attenuated PPR vaccine.

8. Recommendations

The obtained results triggered us to recommended the use of Nigella sativa oil inactivated PPR vaccine instead of mineral oil PPRV vaccine or live attenuated PPR vaccine for its higher potency and safety, Long duration of humoral immunity, interferon production and proliferation of lymphocytes with high ratios.