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SHORT COMMUNICATION

A NOTE ON THE SPREAD OF *Spodoptera litura* (Fab.) NUCLEAR POLYHEROSIS VIRUS THROUGH *Cotesia* (*Apanteles*) *angaleti* MUESBECK (Hymenoptera: Braconidae)

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ABSTRACT

Study on the spread of Spodoptera litura (Fab.) nuclear polyhedrosis virus from diseased to healthy larvae through larvae parasitoid Cotesia (Apanteles) angaleti Muesbeck revealed that the mortality percentage of S. litura larvae exposed for 24 hrs and 48hrs were 30.28 and 43.30 as compaired to 6.78 and 7.34 in control respectively

Nuclear polyherosis virus (NPV) has been reported to be an effective candidate for biologycal control of several polyphagous lepidopterous pests. The NPV infected insects as two phenotypically different virus particles viz., (1) occlusion derived virion (ODV) which establishes the intial infection through the midgut, and (2) budded virion (BV) which spread infection within the host. Occlusion derived virions are contained within the polyhedral inclusion bodies (PIBs) called polyhedra. The enveloped polyhedra are released into environment through cells lysis when the insect dies. The occluded PDVs are capable of persisting forextended periods out side the host insect and can continue infection cycle in another host. Tanada (1964) noted that dispersal of pathofen occur through movement of healthy carriers, infected hosts, parasitoids, predators, and other factos like wind, rain, air ect. With regards to spread of NPV associated with the reduction of dense population's of tobacco caterpilar *Spodoptera litura* (Fabricius), information available is very scanty hence, laboratory studies on the role of larval parasitoid, *Cotesia* (*Apanteles*) *angaleti* Muesback in vectoring *S.litura* NPV were carried out.

Healthy larvae of *S. litura* were maintained at 27 ± 2^0C and 60 ±10 per cent relative humidity. The stock solution of NPV collected from diseased dead larvae was partially purified through a process of centrifugation and purification. The pellet virus material was suspended in distilled water as stock solution of NPV for futher experimentation.

The parasitoids, *Cotesia angaleti* required for testing the transmission of NPV on to healthy larvae were reared on the larvae of rice meal moth, *Corcyra cephalonica* Stainton as detailed by Gautam (1994). Thirty newly emerged adults of *Apanteles angaleti* were placed in each jar (10x15cm) with infected larvae (2-3 day) of *Spodoptera litura* for contamination. They were fed with NPV concentration of $2.2x10^6$ PIBs/ml to develop full disease symptoms. The diseased larvae were placed into each jar and exposed to 30 adults of *C. angaleti* for 24 hrs and another group for 48hrs. The parasitoid were then released in three jars as replicate each containing 4-5 days old twenty healthy larvae of *S. litura*. In control, the parasitoids were exposed to healthy larvae. The healthy larvae after 24 hrs of exposure to contaminated parasitoids were transferred to another jar and fed with frest castor leaves. The mortality of the larvae was obseved daily.

The incidence of mortality caused by virus in the larvae exposed to contaminated parasitois, for 24hrs and 48hrs was compared on 6^{th} day onward up to 11^{th} day. In both cases, the mortality was higher than control. Total mortality percentage of larvae exposed to parasitoid for 24 hrs and 48hrs were 30.28 and 43.30 as compared to 6.78 and 7.34 in control, respectively (table 1). Raimo et al (1977) also reported gypsy moth's 16 per cent to 23 per cent larval mortality due to NPV contaminated through *Apanteles melanoscelus.*

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Table 1. Transmission of *S. litura* NPV disease through *C. angaleti*

Exposure period	Larval mortality (per cent) (Days)						
	6	7	8	9	10	11	total
C. angaleti exposed to infected *S.litura* for 24 hrs	0	0	2.08	9.60	11.10	7.50	30.28
C. angaleti exposed to uninfected *S.litura* for 24 hrs	0	0	1.48	0	3.0	2.3	6.78
C. angaleti exposed to infected *S.litura* for 48 hrs	1.8	3.1	6.30	11.40	14.00	6.70	43.30
C. angaleti exposed to uninfected *S.litura* for 24 hrs	0	0	1.10	1.68	2.80	1.76	7.34

The purpose of this study was to determine the ability of parasitois to spread NPV among healthy larvae through the act of parasittixation and contaminated food. Probably, PIBs might have been transferred to the healthy larvae through contaminated food of contaminated parasitoid. Accoding to Magnoler (1975), epizootics may occur in the field by spread of the disease through the parasitoi and also through other means.

The result of this study determines the role of parasitoids that can spread the virus to the host population, so the study can augment efforts to initiate virus epizootics artificially through parasitoids on the polyphagous tobacco caterpillar *S. litura* populations. Further, tests to determine the ability of parasitoid to vector the virus can be made in the field condition as well as in laboratory to establish that virus can be an ideal component in IPM program

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SUMMARY IN VIETNAMESE

Vai trò của *Cotesia angalaeti* đối với sự phát tán *Spodoptera litura* NPV (SlNPV)

Một đặc điểm nổi bật của việc sử dụng NPV trên các đối tượng sâu hại là sự chuyên tính cao đối với ký chủ. Vì vậy, nó không ảnh hưởng đến các loài thiên địch ký sinh (ong, ruồi..), côn trùng ăn thịt (bọ rùa, kiến ba khoang…). Ngay cả sản phẩm thải ra của chúng cũng gây sự nhiễm NPV đối với sâu hại thông qua sự phát tán. Nghiên cứu trên đây cho thấy vai trò của *Cotesia angaleti* đối với sự lây nhiễm NPV trên ấu trùng của sâu ăn tạp *Spodoptera litura,* thông qua sự tiếp xúc với ấu trùng *S. litura* đã bị nhiễm NPV. Kết quả cho thấy phần trăm chết của ấu trùng *S. litura* sau khi bị *C. angaleti* tiếp xúc là 30.28 % (đối với khả năng mang PIB của *C. angaleti* trong 24giờ) và 43.30 % (đối với khả năng mang PIB của *C. angaleti* trong 48giờ) cao hơn nhiều so với đối chứng là 6.78 %và 7.34%, theo thứ tự. Kết quả này khẳng định được khả năng của thiên địch có thể phát tán virus trong quần thể sâu hại, đóng vai trò trong việc gây thành dịch bệnh trên đồng ruộng.