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NRCPD-OUAVM Joint Research Report

Date: May 30th, 2018

Project no: 29-10

1. Principal investigator

Name: Haiyan Gong

Position: Associated Professor

Affiliation: Shanghai Veterinary Research Institute, Chinese Academy of Agricultural Sciences

2. Project title: RNA interference of Serpins in Soft tick *Ornithodoros moubata* to reveal the molecules associated with serpins function

3. Collaborating research group members at NRCPD

Name: Rika Shirafuji

Position: Assistant Professor

4. Research period (in mm/dd/yyyy, and total number of years)

April 1, 2017 – March 31, 2018, one year

5. Purposes and objectives

(1). To obtain the serpin gene of *O. moubata*.

(2). To investigate the role of serpins on the feeding and production of *O.moubata*.

6. Outline of research process

(1) Isolate serpin molecule form the *O.moubata*;

(2) Analyze the sequence;

(3) Synthetize the dsRNA of serpin gene and controls (luciferase)

(4) Investigate the impact of serpin silence on the tick feeding and oviposition.

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7. Outline of research achievements

(1) The serpin gene of *O. moubata* encoded a protein of 424 amino acids, containing a signal peptide of 20 amino acids and a serpin domain (73- 423 aa) (Fig.1), and the mature protein has a molecular size of 44.5 kDa. The protein has a high homolog (65%) to that from another kind of soft tick *Argas monolakensis* [ABI52767］but a low homology to that from hard ticks (35 % to that of *Amblyomma americanum* [ABS87362]) (Fig. 2)

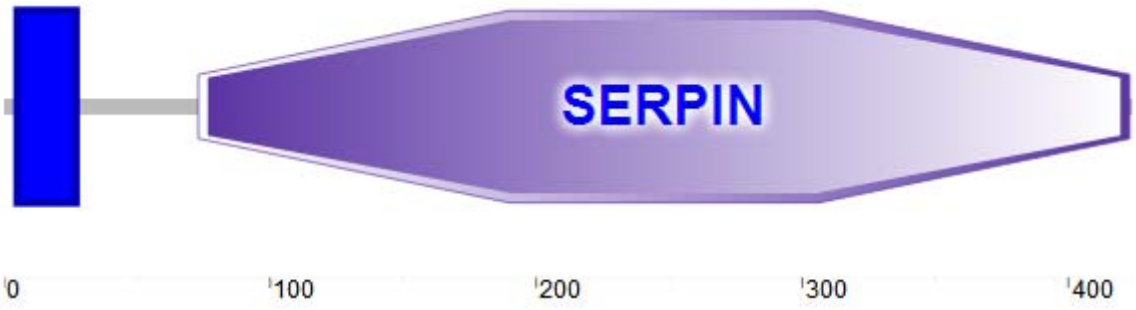
(2) Interference of serpin (Fig. 3) in the adult ticks affected the attachment rate (83% in control group VS 64% in tested group), but didn't affect the engorged body weight (0.25046±0.02381g in control group VS 0.26877±0.02451 g in tested group, P>0.05 by student's t-test) nor the oviposition (100% in both groups).

8. Publication of research achievements

The paper is under writing for publication.

Attach reference materials as necessary.

(1) Figure 1 Domain of serpin from *O. moubata*



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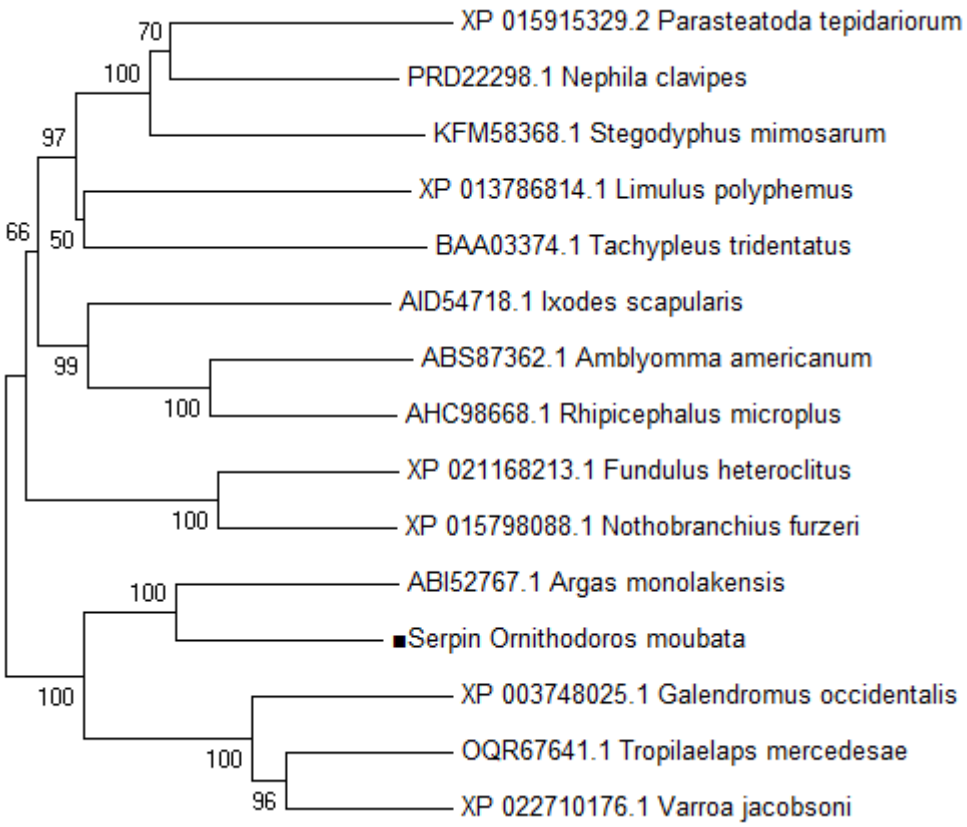
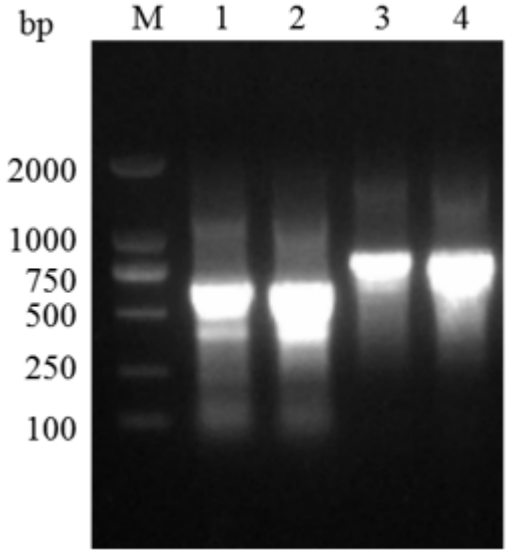
(2) Figure 2 The phylogenetic tree of serpin from *O. moubata*



(3) Figure 3 Synthesis of dsRNA



Lines 1 and 2, dsRNA of luciferase; lines 3 and 4, dsRNA of serpin