The 7th INTERNATIONAL BIOTECHNOLOGY SYMPOSIUM
"BIOTECHNOLOGY IN SOLVING GLOBAL ISSUES"
19-21 August 2021

Interaction of antigenic recombinant coat proteins against the affinity purified antibody of rice tungro viruses: A preliminary study

Sheryl Tunung Gariso[1], Magdline Sia Henry Sum[1*], Yee Siew Fung[2]

[1]*Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia*
[2]*Agriculture Research Centre, Semengok, Department of Agriculture, Sarawak, Borneo Heights Road, 93250 Kuching, Sarawak, Malaysia*

**Corresponding Author:* shsmag@unimas.my

Rice tungro disease (RTD) is a major destructive rice viral disease. To date, the common practice of detecting RTD is still based on symptoms visualisation. This is because methods like polymerase chain reaction (PCR) and enzyme-linked immunosorbent assay (ELISA) which are conducted in the lab are limited for many farmers. As paddy planting is more dynamic in the rural region, sending samples is inconvenient as facilities providing the services are located far from the farms. Therefore, an easy and rapid method that can be utilized at point-of-need is advantageous to help manage RTD. This study reports on the use of antigenic recombinant coat proteins of the tungro viruses; *Rice tungro bacilliform virus* (RTBV) and *Rice tungro spherical virus* (RTSV) to develop a rapid serological for the detection of RTD. The aim is to produce affinity purified antibody against the coat proteins (CPs) of the tungro viruses. In our previous study, we have successfully cloned the RTBV CP and RTSV CP3. Here we report the result of the reactivity of the IgG purified polyclonal antibodies of the RTBV CP and RTSV CP3 tested in Western Blot and indirect ELISA. The binding affinity of the antibody to the antigen was evaluated in these two assays. The result showed similar pattern in reactivity between the two IgG antibodies of the RTSV CP3 and RTBV CP sera to the corresponding recombinant coat proteins (rCPs) in the immunoblots. The indirect ELISA result shows that the RTSV CP3 protein reacted strongly to both IgG antibodies, however it was noticed that the binding affinity started to decrease at higher concentration of the antigenic protein. This differs with the reactivity of the RTBV CP protein as binding of the IgG antibodies for the protein gradually increased with protein concentration. In conclusion, the IgG purified polyclonal antibodies against the rCPs of RTSV and RTBV show potential binding ability to be used in a rapid serological assay. However, the sensitive immunoassay can be further developed by optimizing the conditions of the rCPs and the affinity purified antibodies.

Keywords: Coat protein, rice tungro viruses