Indian J. Fish., 47(3) : 243-245, Jul-Aug., 2000

Note

Occurrence of white spot syndrome (WSS) in a prawn farm at Cochin

JASMIN, K. JOSE AND MARY, K. MANISSERY

Central Marine Fisheries Research Institute, Cochin - 682 014, India

ABSTRACT

Occurrence of White Spot Syndrome (WSS) was notiped in farm reared *Penaeus indicus* H. Milne Edwards of size group 110- 150 mm at Munambam, Cochin in January 1997. The affected prawns showed symptoms, similar to those reported in *P. monodon,* such as sluggish movements, absence of feeding, escape reactions, reddish discolouration, white spots on cephalothorax and abdomen and loss of part of one or both the antennae. Histopathology of hindgut from the affected *P. indicus* revealed the presence of inclusion bodies.

Among the various diseases, affecting prawns from the wild and the culture ponds, it is generally recognised that viral infections cause the greatest threat to the prawn culture industry. This is primarily because very little information is available on the taxonomy and biology of these pathogens, so that effective preventive and control measures could not be developed. They cause complete destruction of the stock within a few days (Lightner, 1993). According to Lightner (1993), as many as eleven viral diseases of cultured penaeid prawns have been identified and described. Recently, outbreak of a new disease, resulting in mass mortality of the cultured prawn stock was reported from southeast Asia and Indo-Pacific region (Wongteerasupaya *et al.,* 1995; Wang *et al,* 1997). This disease is increasingly known as White Spot Syndrome (WSS) and the agent(s), White Spot Syndrome Baculovirus (Chou *et* aZ., 1995; Wang *et al.,* 1997).

In China, 80% reduction in the cultured prawn production, amounting to US $ 1 billion was recorded in 1993. Thailand reported a loss of US $ 500 million in 1996, due to WSS outbreaks. This shows the dreadful effect of this disease on the world economy (Wang *et al,* 1997).

The white spot syndrome was first reported in *P. chinensis* from Japan, in 1992 and it spread to other shrimp farming countries (Chang, 1998). In India, the disease was first noticed towards the end of 1994 (Karunasagar, 1997). Eventhough, several penaeid species are known to be affected by this disease, detailed studies have been conducted mainly in *P. monodon* and *P. japonicus* (Takahashi *et al.,* 1994; Nakano *et al.,* 1994; Chen and Kou, 1994). The present study emphasises the histopathology of the hindgut of *P. indicus,* affected by WSS.

Affected, live specimens of *P. indicus* and *P. monodon* were collected from a

l . l ,

' I

! 1

I l ' M ≍ . . . . ; l ,

i h

I / . l l l j . , 1 , , 1 l l l ,.' ,M". , l. ' / " ' '
• ,, in.! i '. , ,» . • • J;iii' l ci . l. i i-l th'
* *J., .. U .i* 'til ' ii "i Hl j,hi|.< Hl. l;[1] l'.ii
, : i l l ' i '•)••

! /.

' l i , l . |,'/i I|I . . ! I > ' n (ii : i
M'f I >l (M M '! I- i,: ii-.!, ,1,,)<,!', I u > .,n
iinl • ••; '1 ••! li i ' . M l . iniiiii i n
'.'. ..l / *'ll* l'»'l , , 1,11 Milllul; 1j1•1l,|
[1] 1' . ' J l l .. .'l', '•' I '»' * , l . l ' l i t ' | l l I < 1)1
Mi.!- II.' < h.ii «< i I i .1 li • ill,it ,ll ' l"lli ii,
• C'I ' Hi[1] I lii l|.|.' I' lit' <' <(l
ii h , i I •>'(i , , l i |,'|| i l l I ! I n l i • I I'l
' '•>••/ il ' I j.ll.ll' il l'll I ll l.l (UlMHlH ll
i l'.i.l »i l'll l. l|l n|.-ll l il M l i
lll'n i l Mill l')[1] 'l ll !lil>' «'ll,i'lll i', l , ,i»!,i ,ll, l l' '\ ll! ' .// l i'l'J,
i :l i d . l i i *i ' f '* i)[1] i • I ' i \ i l I H U i ,' i .'
' I';'[1] l • ,M,I • l« -ii ii.d I'.,,'i ' l'l'» 11 II. /'
; < ,[1] •>„' '. ,1/, *n*< ,,)• , . *t* , tint /'
' ,',,'/ III H.f i.il h.ili,' li |l • ll Hi) ' '
il f I , - . i. > ! I - i I i r , i i • i, ; , i 1 1 M I
- i l l , i- : i 11 i,i ', 11 | H ! 11. ,| .1 ,i''ii i n n lei
'I'll • <*i* il i i-I, '<;> [1]u |,iii,,|V i >•!•,' liiui i'
•.I .ijJiih in, lii. iij|. (null,' IIKI in,cli
.1 .(ill ' ..(I ll ,>>), . Mill ,• Il> I !,(,' I'
>'• • ' I .1 ,11 *I" 'It'll*, 11) I III' (111', fill
ii>: . . i • i). . . l, i i ii li ,\ , i i i," i / !,•'
i ' ᶜ ' i l »>ii , iii.| • ' •; / ' l'l'Hi ,l,,|| ' • ii 'i ii.i 111>.i i ' ' ,<' , ; V) "ti in i hi.
1. I"l ' t'll-lil / |i|.|| i l l , I]]l(Ufll | l.J t| . i i . ',i < < *! ,* • • < ,'• •• ,*h* .,(.„.. l' . • '- .• , . / , ; ' / ' , , ' ' , , il 'I / ' *li'li,t*

Nuclear hypertrophy of the infected cells is because of the development and accumulation of intranuclear virions. The cytoplasm around the infected nucleus gets thinned as the viral development progresses, leaving a transparent zone surrounding it, which appeares as a 'halo' in the present study, as reported by Wongteerasupaya *et al.* (1995) in *P. monodon.* Death occurred in some *P. indicus,* which did not show any external symptoms, characteristic d" WSS. However, histopathological studies of the affected tissues from such lethargic specimens also revealed the presence of inclusion bodies.

References

Bell, T.A. and D.V. Lightner 1998. *A Handbook of Normal Penaeid Shrimp Histology,* p. 2-6, World Aquaculture Society, Baton Rouge, Florida.

Chang, P.S., D.H. Tasi and Y.C. Wang 1998. Development and evaluation of a dot blot analysis for the detection of white spot syndrome baculovirus (WSBV) in *Penaeus monodon. Fish Pathol.,* 33(2): 45-52.

Chou, H., C. Huang, C. Wang, H. Ching and C. Lo 1995. Pathogenicity of a baculovirus infection causing white spot syndrome in cultured penaeid shrimp in Taiwn. *Dis. Aquat. Org.,* 23: 165-173.

Durand, S., D.V. Lightner, L.M. Nunan, R.M. Redman, J. Mari and J.R. Bonami 1996. Application of gene probes as diagnostic tools for white spot baculovirus (WSB) of penaeid shrimp. *Dis. Aquat. Org.,* 27 : 59-66.

Karunasagar, I., S.K. Otta and I. Karunasagar 1997. Histopathological and bacteriological study of white spot syndrome of *Penaeus monodon* along the west coast of India. *Aquacult.,* **153** : 9-13.

Lightner, D.V. 1993. Diseases of cultured penaeid shrimp. In: *Crustacean Aquaculture.,* 1, 2nd edn., p. 393-486. J.P. Mc Vey and B. Raton (Eds.), CRC Press, Boca Raton, Florida.

Nakano, H., H. Koube, S. Umezawa, K. Momoyama, M. Hiraoka, K. Inouye and N. Oseko 1994. Mass mortalities of cultured Kuruma shrimp, *Penaeus japonicus* in Japan in 1993 : epizootiological survey and infection trials. *Fish Pathol.,* 29: 135-139.

Takahashi, Y, T. Itami, M. Kondo, M. Maeda, R. Fujii, S. Tomonaga, K. Suapamattaya and S. Boonyaratpalin 1994. Electron microscopic evidence of bacilliform virus infection in Kuruma shrimp *(Penaeus japonicus). Fish Pathol.,* 29 : 121-125.

Wang, C.S., Y.J. Tsai, G.H. Kou and S.N. Chen 1997. Detection of white spot disease virus infection in wild caught greasy black shrimp, *Metapenaeus ensis* (de Haan) in Taiwan. *Fish Pathol,* **32(1)**: 35-41.

Wang, C.S., K.F.J. Tang, G.H. Kou and S.N. Chen 1997. Light and electron microscopic evidence of white spot disease in the giant tiger shrimp, *Penaeus monodon* (Fabricius) and the kuruma shrimp, *Penaeus japonicus* (Bate), cultured in Taiwan. *J. Fish Dis.,* 20: 323-331.

Wongteerasupaya, T, J.E. Vickers, S. Sriurairatana, G.L. Nash, A. Akarajamorn, V. Boonsaeng, S. Panyim, A. Tassanakajon, B. Withyachumnarnkul and T.W. Flegel 1995. A non occluded systemic baculovirus that occurs in cells of ectodermal and mesodermal origin and causes high mortality in the black tiger prawn *Penaeus monodon. Dis. Aquat. Org.,* 21 : 69-77.