

PI
J F
- |,
b O
5 Av I
D J &
D 4 S 6
7 ST /
O U d Op
5 O U
gellan
Wo 5 -
750'

| 3i 5' SHL.

5! | L@k |

58 DEFG

| + ' m! mEF { | # F \$ % () (B , @
"#5T \$ J % - "# # \$ H % , F % & n ! D n \$ % J # !
9 # g T , % = W ' 4 . p " Wo (3 ! ! @ @ @ @ R) T P K
j . Q (c 2) U 3 o (1) . W t , # V { . ' [j , K j
~ 4 e a (* - D a) 7 o , ; K j k l ' ' « () p K e }
W | 5 G Y 8 - " # # G » [54] . n \$ % ' m b T T ; o } *
v , F H g g T K d E , # n x # b ; q , r , s J t :
N & | " @ A E X , i Y # a \$ u 4 5 .

58 HI e + {

F % # n \$ % # g g T , b N v w : S ' L W ,
n # t o K ! U U ' (5 N & E X , A m _ O A x y
[j " J = v , G b z m { o | . , > } ~ ! U { " , E
X F q , # x \$ % m | & F (4 %) I ' a , X ' U ((D U O R _ e ! H) O R N v w U N & S ' L W . F %
h [j # 5 # # v N N & F q , F # F q K ' ! # g : 1
(*) 5 t _ (* + l + 5 6 n >) , s t ; i ? { U j
N & S ' , o [55] .

58 JVK + @L

1 b ; q , r , s J t : N & | " @ A J / E X \$ u
~ } J Y = , 6 , . - ; L , Y # F . / + [v , > 5 m ~
} O & . ! = c E B ^ [56] k W 5 K F b (. ' &) (+ ; E
@ R ^ e , 2 - @ U - R - @ " W Q T s w E X & 5 / / ,
2 7 p : O 1 % ' 8) K j .

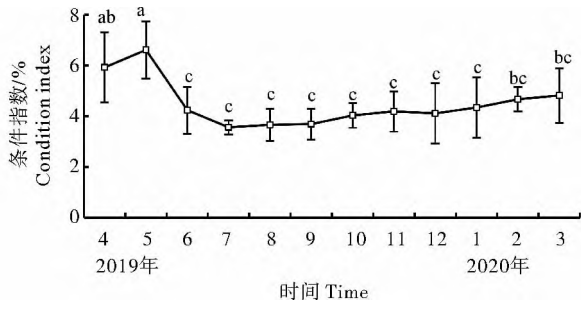
58 M' oB

F % # 5 # g n \$ % g T , 1 & T p : 2 J X
Y # a 1 2 " 1 , 3 3 , { ; i & T p ~ p ' (B) / ; i
2 J ~ p ' (B) s t F % O 1 [4 (*) , U j N & S '
, o [59]

" #

B! C, ^: CD| #F(' n\$%N&S' : 6w. " D\$vw





, 6@,Y-5# %' ' * OvCDOK ,5# %, j \$ 5
 %J m; 2Lg(? < 9)。
 s J t (G 8 G b i " 8 j b) 2 7

< ! ! | + (B n \$ % O 1 [4 A v v w
 - B 8 ! 1 6 F C E D S E < C ! C ? C M < C ! > M N C F
 C . g i g a s > ! < - 4 F C 6 ! E C C F ! 2 E - 6 B ' R E M

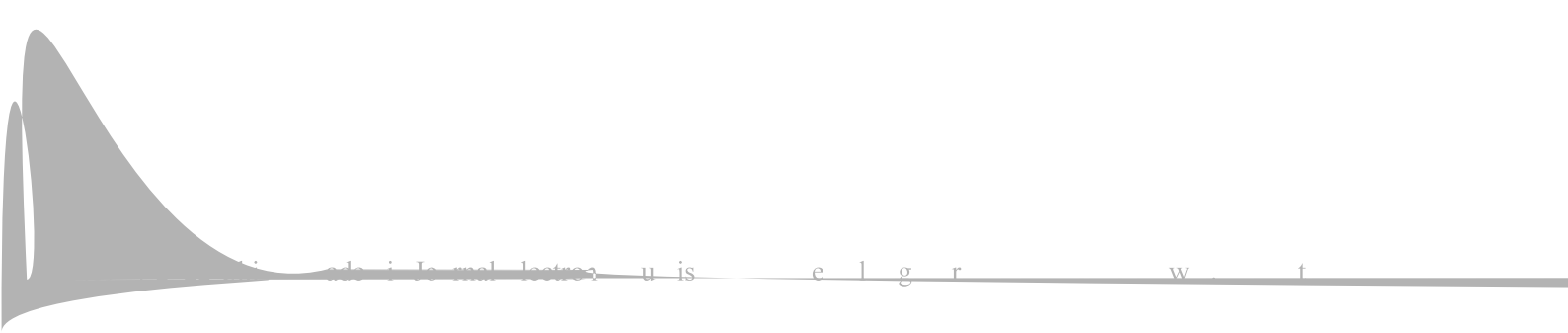
" #

B! C, ^: CD| #F(' n\$%N&S' : 6w. " D\$vw

!! N&|" @A(YGbi "8Hb)5O1%' Oms
J t ("8! bi 59! b),b; q(U8 bi #8" b)U
r (H8Hbi 58" b). sJ t UN&|" @Avw=O
ds,XD4S6t(5%),O1%' L3[*,X! %

N&. * #W' 6* ;huD489,O1%' Ok,
8o56#v%' L3[* . b; qUr O1%'

Bn\$%X: 4. * +, &: _%. 7*,8: v:
 _L3; I . O1[4@: _vw13- g{ 6' U
 5- . n\$%N&5S' , o.
 H8WTU8HI JVK +=9: UV
 //XEJ 2PD4S650' SK+, &M3
 i J =,; %' 5>5@, Pvw@6) bOJF 1
 2^[#+B]. ~~@=6~~ ^^[H] 67I ' I (Xn\$%@/
 />5125Y6*) ,XD4S6L = ^ ^ O5>
 5O>,huD4S6>5O>L3Ok . H67'
 n,D4S' . * LwEX//%' L37K.J %W
 ' 6*?,huD4S' . * ,wEX//%' Ok.G
 %k, 6@,Y-5#%' ' [* . ; / . gO{ r:l
 ; VP- r HU# \$,qbgWoZoT" //5,
 P;Y-5#%n\$%N&S' hr (m89v#@P5
 #,N&&) 8WD4CD3OMJ ,D



FC@E]AE?ADAG E M [DM RCL! UE EB@U6 <[O]8+]AE?ADAG
"##Y,"Y5(5J):JHJY8

[5#]! ,>d. (RME!^, ^C@X816FC ED7C-6U>EDSE@E-CR> !SE?F
>RCR@BC EMD<FR4MA@, B R@NED UEAE<C [O]8-R@6R
1?676 "###, 99H):!#! #Y8

[55]! c de, Z D, 8 F x, ^ 8 CDyp + (Y! SYN&S' \$
D# 67 [O]8&' () * + +, (@AG + B), "#5', J" (55):
"YHJ 8
X6dip, ,>d, 3E !4!c, 6!ED8+; AEDCR6E<C!C!<@6@
M?<C!C!R@! *TEU (Mactra! veneriformis) > -E7> B<@; @=
?CER!C!1-E MC B\$6> RAE [O]8@6@EDCF! (7E !/; S@R<!C
*=>E, "#5', J" (55): "YHJ 8

[5']! ^B 66 12, * =@RC@<P> !W8&@QAR<S@? 7@ E M7C M!
<C> B C! @E R@7E<M R@EDCR (Pecten! maximus) FC@U FS6
7@C@RCL!C@AE<CR> !. @ [E [O]8+]AE?ADAG "##Y,"Y
(5J): 5#11598

[54]! ' G () RQpK&Yg () pKe} ! Gp" :K (g' 6g
| + U6r pK: W] 5G-0Y8 -"##G[1]8y b: &' &' WB
c, "##Y8
. E<C ED^E@ 4% S@C U6 <ED^C>@ B*6 <@2-410F>E
<C!FC@^E@ 6!^C>@ B!E@G: %@B@ED1A@6!FC@ (FR@C@
\$DA<C!E M_@B@ED^C>@ B: W] 5G-0Y8 -"##G[1]8_6!
K@ B: 1-E M@R@S@R@C! *=>E, "##Y8

[5]! h! C, i Pj , mk (, ^ 8n \$ % J Dj ' I T N & S ' @
O (. " 5D \$ v w [O]8&' . . G + , "#5G, "J (5): J#JT8
) 6 B * ! ^ , X C B, ! - . 3A! & ! 4, 6! ED816FC EDSE@E-C! > ! B@
; EMD@6@U6 < E M; A@<S@?UC@ 6 <R> ! <@ E DM! R@ED
7@C@MRE> ! C! SE?F?C R@ (Crassostrea! gigas) [O] 8@@ EDC
-R@! 1?676RC! *=>E, "#5G, "J (5): J#JT8

[5]! cE B!C!O 3E BQ!^, ,>d, 6! ED8) 6@U6 <C! ?E7E<C
U@B@FC@E@M@6@> E<C!C! ?=6U>ED?UC@<C!C! SE?F?
C R@ (Crassostrea! gigas) 7!; @> R@C@M@ED-E ?B R@<C R
7C [O] 8@@ EDC! =DR! & R@=, "#3 , HJ ("): H#H#T8

[59]! cED4\$!&8N@U6 <RC! <@7ADAG> ! <@RECI <@7A<@FR=
Venerupis! decussata!, 8 [O]8+]AE?ADAG 5TC9, YU): H@H#58

[5G]! _E@_JO _DL4: 108% @B! R@E@E MA<E<C! > ! @E<C! <C
E U6CB6 <R> ! Argopecten! irradians! concentricus (RE) [O]8
@@ EDC! N@U6 <ED^E@ 4_@B! E M% @B , 5Y5. !"
("H): 5'55HJ 8

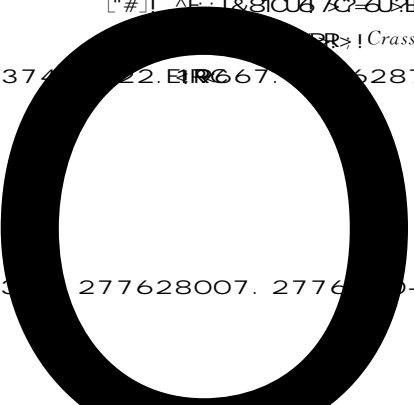
5

[5Y]! ^CPE !% ^, X@GL! ^! + 8&@QAR<S@? 7@ C! C@D@ TEU,
Amiantis! purpurata (>SESE: O6 @ME) > !; @=<@! SEBC<E
(+@B @ E) [O] 8@@ EDC! <@^E@ 4_@B@ED +R@E<C! C
<@/; >MX> BCU, "## , Y! ("): H@H@H8

[5T]! -E7@N* , 4AS@+ , 1CA=A!\$, 6! ED8@UC@E@E M@GC
C@M@E@ Crassostrea! gigas @C@AR<S@> @ ED7C [O]8+ |
AE?ADAG "## , "#(5"): J! YJG#8

[#]! AE : 1&8!CU6 7C-6U>DE MC: R@B@EDFC R@C! B@C <=
R@> ! Crassostrea! gigas! E M Ostrea! edulis B@C ;

1 374 22. 31R@67. 2287TD[(R4O) Tj \$332(8) 479(2) 372(6) 319(U)] TJ 3. 626669- O. 053333TD(C



\$@R, 5YH("): 59 |" 5G8
 [H]! _>O4, , >d, , >d, P-E BeO 6!ED8!6FC ED?E<C!C!7C?-6U?ED
 ?UCC 6 -R>! ?EU (Saxidomus| purpuratus| 1C| @? ! 5Y! ") >
 @E<C! <C>R@C@C@MA?<S6? 76E M<66 S@ U6 -ED?C M<C
 C!1E BBOALE , * => E[O] 80A@EDC!(?E !/; >S@R< !C!* => E,
 "#59, 5 ("): HJ5H#8
 [H9]! 3E B!4!1, XE B) !4, \$@! !4!1, 6!ED8!6FC ED?E BR>!@

@MA?<C! E M 7C?-6U?ED?CUOR<C! C! <6 ?C!D6, Fulvia
 mutica! 8666 (5YJ), >! * =C RALE !C! <6!c6R! *CER! C!XC
 @E[O] 80A@EDC!1-6DR-!&6R@=>, "#55, H#(5): T! |5#58
 [HG]! 3E !4!c, , >d, , >A!c!W, 6!ED8!6FC ED?E BR>!@C@MA?
 <S6E?<S< !E M7C?-6U?ED?CUOR<C! C! <6!C@? ?EU Sinon|
 ovacula|constricta (, EUE@L!5Y5)[O] 8^E@ 6_@DB !&6R@=>,
 "#5#, 9: G!YY8

Seasonal Variations of Gonadal Development and Biochemical Components of *Crassostrea gigas* in Tianheng Island Sea Area, Shandong

, S! ^> 5, , >d< 5"

(586!, E7C@C!C! ^E@?A@6 (?E !/; >S@R< !C!* => E), ^> R@!C!M^E<C , >BMEC" 99##H, * => E: " 8 E7C@
 <@!FC@ ^E@ 6- R@C@R!T?6 ?6E M-CM\$@MA?<C !@C?6RR, \$E<

^7(E)540(@=