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Density of juvenile of tri-spine horseshoe crab *Tachypleus tridentatus* in the Sone Estuary, Kitakyushu, Japan,
with notes on sediment particle sizes in habitats and breeding areas

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Kitakyushu, Fukuoka 800-0232, Japan

2016 7 16 18

8.0 52.0 mm (N = 68)

875 /ha

215.0 377.0 mm

40 56

55

4

7

0.77 2.58 mm

Abstract

The density and composition of developmental stages of juveniles of the tri-spine horseshoe crab *Tachypleus tridentatus* were investigated at the Sone tidal flat, Fukuoka Prefecture during 16 to 18 July, 2016. The sizes and sexes of dead adults beached on the shore were also examined. The carapace width of juveniles collected at the mouth of the Nuki River ranged from 8.0 to 52.0 mm (N=68). The density of juveniles was about 875 indiv./ha, with the density decreasing in the offshore direction. However, mean diameters of sedimentary particles did not differ considerably among five line transects set up from the inshore to offshore. The carapace width of beached dead adults ranged from 215.0 to 377.0 mm (N=55) with sex proportions of 40% male, 56% female, and 4% unidentified. Some dead adults bore a broken tail spine or contained eggs in the bodies. Mean sizes of sedimentary particles at the seven breeding areas located along the inner part of the flat ranged 0.77 to 2.58 mm, and tended to be more coarse than at other breeding areas in Japan.

Key words: tri-spined horseshoe crab, density, Sone tidal flat, sediment, mean diameter of sedimentary particles, juvenile

(1)

Tachypleus tridentatus (Leach, 1819) 517 ha

3 1

(, (, 1993, , 2015)

1984) 1920 1930

4

(, 2015)

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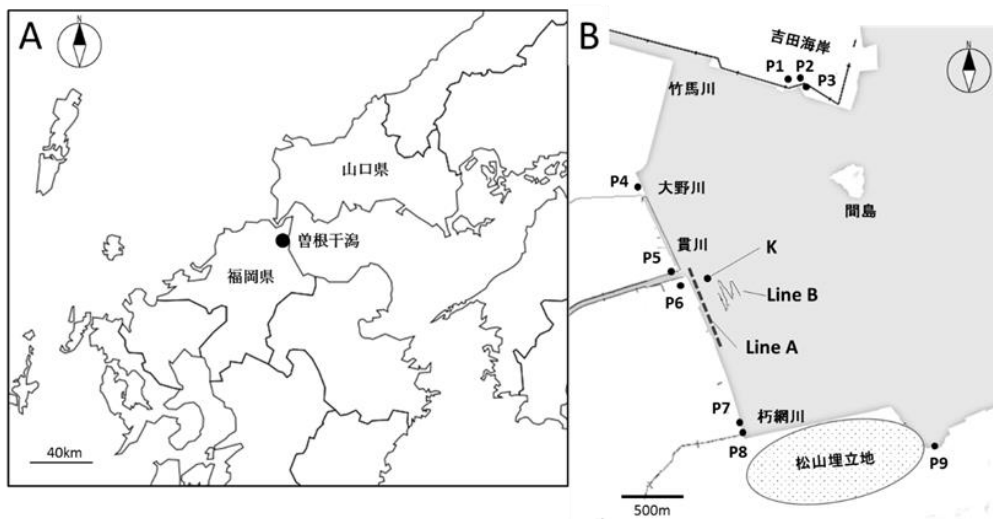
, 2012, , 2017)

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, 2014) 1994

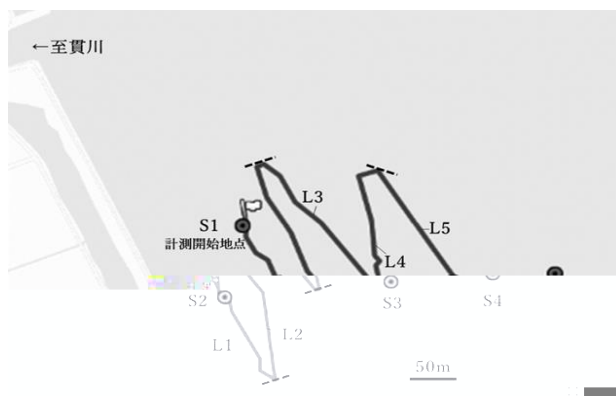
(, 2012)



1. (A. ; B.). P1 9 ; Line A ; Line B ; K

2016 7 18
 (11:00 13:00)
 (, 2015) (2015)
 (1, 2)
 200 m
 5 (2)
 8 m
 6 4 GPS
 1995 2000 (m-241, Holux Technology, Inc.)
 120 2001 2005
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 1,581 2006 2007
 513 265 4
 2012 738 2013 1,079 5 6 3
 (, 2015) 2016 500
 (, 2016,
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2016 7 18
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 (1, 2)
 200 m
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 1995 2000 (m-241, Holux Technology, Inc.)
 120 2001 2005
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 513 265 4
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 (, 2015) 2016 500
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 , 2017)
 (, 2007)
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2. (Line B)
 (L1 L5) (S1 S4)

2016 7 17 (8:00 12:00)
 (1, K) 68
 (1984)

2016 7 17 (9:00 11:00)
 (20 cm)
) 3 (1,
 P1 P3) 1 (1, P4)
 2 (1, P5, P6)
 2 (1, P7, P8) 1 (1, P9)
 2016 7 18
 (12:00 13:00)

2016 7 17 (8:00 12:00)
 (1, K) 68

2016 7 18
 (12:00 13:00)
 4 (2, S1 4)
 5 cm

(FS-405, Advantec, Inc.) 120 C 3
 (4.000, 2.000, 1.000, 0.500, 0.250,

0.125 mm)

2016 7 16 (12:00 14:00)
2 km (1, Line A)
(3) 55



3.

(2015)

60 mm

(2, 1) 5

9,440 m² 826 (875 /ha =
8.8 /a) (1)

2006 2007 8 0.04 /a
(, 2007, 2008)

S4

1 km
(2008) 2007 8 S4 4,900 m²
93 (1.9 /a)

8.0 52.0
mm (N = 68) (1984)

7 (4)

2001)

(, 2009)

(, 2015)

(2007, 2008)

2006 8 9.5 61.6 mm 2007 8
13.4 61.6 mm (2015) 1999

2013 4 6

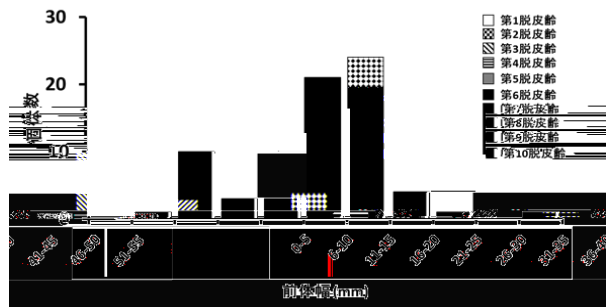
S4

8.0 104.0 mm

L1

1. (Line B)

1, 2



4. (K) 1

調査	幼体 個体数	第4脱皮齡 以下 個体数	第5脱皮齡 個体数	第6脱皮齡 以上 個体数	調査距離 (m)	調査面積 (m ²)	平均密度 (個/m ²)
1	468	57	329	22	393	3276	13.06
2	280	47	240	4	495	2034	21.24
3	176	9	96	1	499	1592	6.66
4	16	2	12	2	469	1352	1.18
7	12	4	6	2	137	2096	1.09
全体	826	109	687	30	1,380	9,440	6.60

L5

2.

(2)

(A)

(B). S1 4, P1 9 1, 2

(2001)

(, 2015)

底質採取地点	中央粒径値(mm)
幼体生息場所	0.69
S1	0.093
S2	0.094
S3	0.098
S4	0.099
産卵場所	
P1	0.77
P2	1.33
P3	2.58
P4	0.81
P5	2.06
P6	0.74
P7	2.05
P8	1.90
	2.9
	>4.00

S1 0.093 mm S2 0.094 mm

S3 0.098 mm S4 0.099 mm

(2, 5, 2)

(2014) 1995 2013

0.067

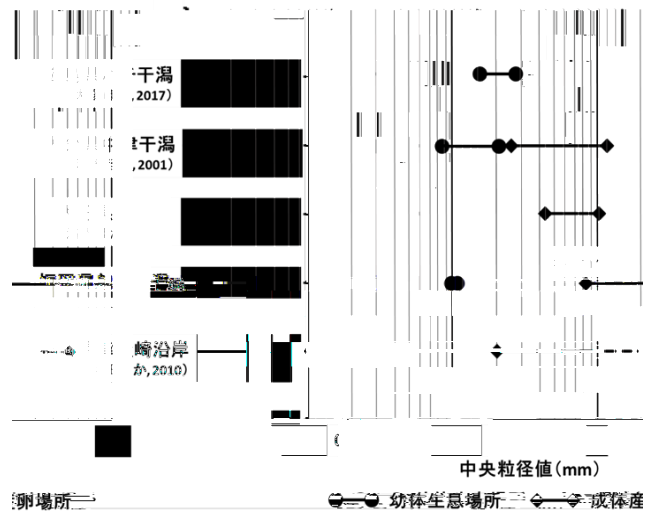
mm

0.15 0.27

mm (, 2017)

0.08

0.22 (± 0.13 ± 0.04) mm (, 2001)

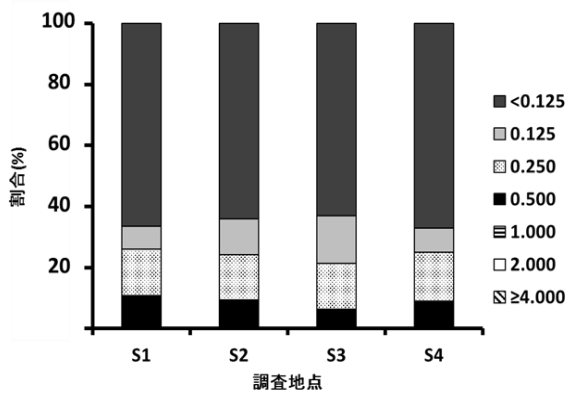


6.

0.10 0.80 (0.43 ± 0.26) mm

(, 2001)

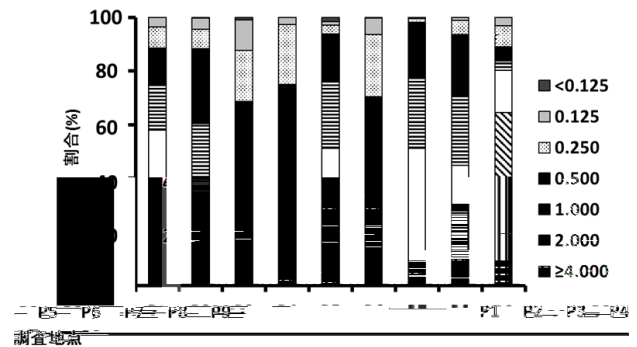
(0.07



5.

(S1 4)

2



7.

(P1 9)

1

0.30 mm) (2017)

(6)

1

13 14

(7) P1

P2 P3 0.77 mm 1.33 mm 2.58 mm (,

P4 0.81 mm P5 P6 2.06 2017) 56%

mm, 0.74 mm P7 P8 2.05 mm 40% 4%

1.80 mm P9 4 mm (8) (2017)

(1, 2) (2000) : 1:1.27

0.42 0.97 mm 0.7 mm 2016

0.25 1.10 mm

(, 2001) (, 2016, , 2017)

0.20

5.00 mm (, 2010)

(6)

215.0 377.0 mm

28 29

251.0 290.0 mm (8)

(3) (2017)

2016 1 11

500

190 330 mm

(2007):

, 23: 447 452.

(2008):

, 24: 729 734.

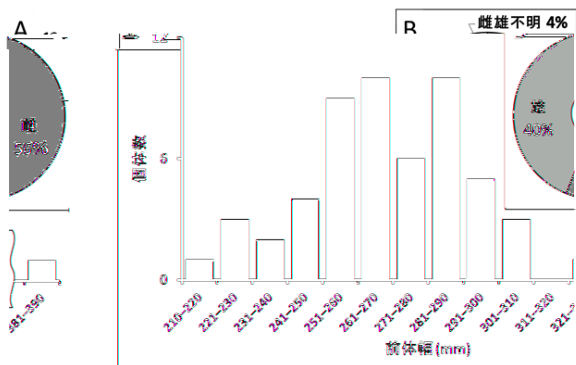
(2009):

8.

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68.



(2015): 1995 2013

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(2001):

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1021 1026.

(2016):

(1984):

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(1993):

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(2014):

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(2017):

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(2015):

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(2017): 2016

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(2000):

(2010):

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7 19.

163 171.