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The different fates of two Asian horseshoe crab species with different dispersal abilities

Tang Q.^a, Shingate P.^b, Wardiatno Y.^c, John A.^d, Tay B.H.^b, Tay Y.C.^e, Yap L.-M.^f, Lim J.^f, Tong H.Y.^g, Tun K.^g, Venkatesh B.^b [✉](#), Rheindt F.E.^a [✉](#)[📁 Save all to author list](#)^a Department of Biological Sciences, National University of Singapore, Singapore City, Singapore^b Institute of Molecular and Cell Biology, A*STAR, Biopolis, Singapore City, Singapore^c Environmental Research Centre, IPB University, Bogor, Indonesia^d Institute of Oceanography and Maritime Studies (INOCEM), Kulliyah of Science, International Islamic University Malaysia (IIUM), Kuantan, Pahang, Malaysia[View additional affiliations](#) ▾[Full text options](#) ▾[Abstract](#)[Author keywords](#)[SciVal Topics](#)[Metrics](#)[Funding details](#)

Abstract

Impending anthropogenic climate change will severely impact coastal organisms at unprecedented speed. Knowledge on organisms' evolutionary responses to past sea-level fluctuations and estimation of their evolutionary potential is therefore indispensable in efforts to mitigate the effects of future climate change. We sampled tens of thousands of genomic markers of ~300 individuals in two of the four extant horseshoe crab species across the complex archipelagic Singapore Straits. *Carcinoscorpius rotundicauda* Latreille, a less mobile mangrove species, has finer population structure and lower genetic diversity compared with the dispersive deep-sea *Tachypleus gigas* Müller. Even though the source populations of both species during the last glacial maximum exhibited comparable effective population sizes, the less dispersive *C. rotundicauda* seems to lose genetic diversity much more quickly because of

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population fragmentation. Contra previous studies' results, we predict that the more commonly sighted *C. rotundicauda* faces a more uncertain conservation plight, with a continuing loss in evolutionary potential and higher vulnerability to future climate change. Our study provides important genomic baseline data for the redirection of conservation measures in the face of climate change and can be used as a blueprint for assessment and mitigation of the adverse effects of impending sea-level rise in other systems. © 2021 The Authors. *Evolutionary Applications* published by John Wiley & Sons Ltd.

Author keywords

benthic dispersal; climate change; conservation genomics; demographic reconstruction; seascape genomics; Sunda shelf

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Funding details



References (76)

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All

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-
- 1 Adibah, A.B., Ng, W.L., Tan, S.G.
The Malay Peninsula as a barrier to gene flow in an Asian horseshoe crab species, *Carcinoscorpius rotundicauda* Latreille ([Open Access](#))

(2015) *Biochemical Systematics and Ecology*, 60, pp. 204-210. Cited 12 times.
www.elsevier.com/inca/publications/store/3/6/4
doi: 10.1016/j.bse.2015.04.026

[View at Publisher](#)
-
- 2 Alexander, D.H., Novembre, J., Lange, K.
Fast model-based estimation of ancestry in unrelated individuals ([Open Access](#))

(2009) *Genome Research*, 19 (9), pp. 1655-1664. Cited 3063 times.
<http://genome.cshlp.org/content/19/9/1655.full.pdf+html>
doi: 10.1101/gr.094052.109

[View at Publisher](#)
-
- 3 Behera, S., Tripathy, B., Sivakumar, K., Choudhury, B.C., Bhadury, P.
Distribution and abundance of two sympatric species of horseshoe crabs along the Odisha Coast, India

(2015) *Changing Global Perspectives on Horseshoe Crab Biology, Conservation and Management*, pp. 181-191. Cited 8 times.
<http://dx.doi.org.ezlib.iium.edu.my/10.1007/978-3-319-19542-1>
ISBN: 978-331919542-1; 978-331919541-4
doi: 10.1007/978-3-319-19542-1_9

[View at Publisher](#)
-
- 4 Berthouly-Salazar, C., Hui, C., Blackburn, T.M., Gaboriaud, C., Van Rensburg, B.J., Van Vuuren, B.J., Le Roux, J.J.
Long-distance dispersal maximizes evolutionary potential during rapid geographic range expansion ([Open Access](#))

(2013) *Molecular Ecology*, 22 (23), pp. 5793-5804. Cited 51 times.
doi: 10.1111/mec.12538

[View at Publisher](#)
-

- 5 Bird, M.I., Austin, W.E., Wurster, C.M., Fifield, L.K., Mojtahid, M., Sargeant, C.

Punctuated eustatic sea-level rise in the early mid-Holocene
([Open Access](#))

(2010) *Geology*, 38 (9), pp. 803-806. Cited 116 times.
<http://geology.gsapubs.org/content/38/9/803.full.pdf>
doi: 10.1130/G31066.1

[View at Publisher](#)

- 6 Bird, M.I., Fifield, L.K., Teh, T.S., Chang, C.H., Shirlaw, N., Lambeck, K.

An inflection in the rate of early mid-Holocene eustatic sea-level rise: A new sea-level curve from Singapore ([Open Access](#))

(2007) *Estuarine, Coastal and Shelf Science*, 71 (3-4), pp. 523-536. Cited 124 times.
doi: 10.1016/j.ecss.2006.07.004

[View at Publisher](#)

- 7 Bird, M.I., Pang, W.C., Lambeck, K.

The age and origin of the Straits of Singapore ([Open Access](#))

(2006) *Palaeogeography, Palaeoclimatology, Palaeoecology*, 241 (3-4), pp. 531-538. Cited 25 times.
doi: 10.1016/j.palaeo.2006.05.003

[View at Publisher](#)

- 8 Botton, M.L., Loveland, R.E.

Abundance and Dispersal Potential of Horseshoe Crab (*Limulus polyphemus*) Larvae in the Delaware Estuary

(2003) *Estuaries*, 26 (6), pp. 1472-1479. Cited 51 times.
doi: 10.1007/BF02803655

[View at Publisher](#)

- 9 Braasch, J., Barker, B.S., Dlugosch, K.M.

Expansion history and environmental suitability shape effective population size in a plant invasion ([Open Access](#))

(2019) *Molecular Ecology*, 28 (10), pp. 2546-2558. Cited 12 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1365-294X](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1365-294X)
doi: 10.1111/mec.15104

[View at Publisher](#)

- 10 Carmichael, R.H., Botton, M.L., Shin, P.K.S., Cheung, S.G.

Preface

(2015) *Changing Global Perspectives on Horseshoe Crab Biology, Conservation and Management*, pp. xxiii-xxiv. Cited 6 times.
<http://dx.doi.org.ezlib.iium.edu.my/10.1007/978-3-319-19542-1>
ISBN: 978-331919542-1; 978-331919541-4
doi: 10.1007/978-3-319-19542-1

[View at Publisher](#)

- 11 Cartwright-Taylor, L.
Studies of horseshoe crabs around Singapore
(2015) *Changing Global Perspectives on Horseshoe Crab Biology, Conservation and Management*, pp. 193-211. Cited 10 times.
<http://dx.doi.org.ezlib.iium.edu.my/10.1007/978-3-319-19542-1>
ISBN: 978-331919542-1; 978-331919541-4
doi: 10.1007/978-3-319-19542-1_10
View at Publisher
-
- 12 Cartwright-Taylor, L., Ng, H.H., Goh, T.Y.
Tracked mangrove horseshoe crab *Carcinoscorpius rotundicauda* remain resident in a tropical estuary (Open Access)
(2012) *Aquatic Biology*, 17 (3), pp. 235-245. Cited 13 times.
http://www.int-res.com/articles/ab_0a/b017p235.pdf
doi: 10.3354/ab00477
View at Publisher
-
- 13 Cartwright-Taylor, L., von Bing, Y., Chi, H.C., Tee, L.S.
Distribution and abundance of horseshoe crabs *Tachypleus gigas* and *Carcinoscorpius rotundicauda* around the main island of Singapore (Open Access)
(2011) *Aquatic Biology*, 13 (2), pp. 127-136. Cited 38 times.
http://www.int-res.com/articles/ab_0a/b013p127.pdf
doi: 10.3354/ab00346
View at Publisher
-
- 14 Chen, Y., Shenkar, N., Ni, P., Lin, Y., Li, S., Zhan, A.
Rapid microevolution during recent range expansion to harsh environments 06 Biological Sciences 0604 Genetics (Open Access)
(2018) *BMC Evolutionary Biology*, 18 (1), art. no. 187. Cited 11 times.
<http://www.biomedcentral.com/bmcevolbiol/>
doi: 10.1186/s12862-018-1311-1
View at Publisher
-
- 15 Chuang, A., Peterson, C.R.
Expanding population edges: Theories, traits, and trade-offs
(2016) *Global Change Biology*, 22 (2), pp. 494-512. Cited 109 times.
www.blacksci.co.uk/~cgilib/jnlpage.bin?journal=gcb&File=gcb&Page=aims
doi: 10.1111/gcb.13107
View at Publisher
-
- 16 Clegg, S.M., Degnan, S.M., Kikkawa, J., Moritz, C., Estoup, A., Owens, I.P.F.
Genetic consequences of sequential founder events by an island-colonizing bird (Open Access)
(2002) *Proceedings of the National Academy of Sciences of the United States of America*, 99 (12), pp. 8127-8132. Cited 223 times.
doi: 10.1073/pnas.102583399
View at Publisher
-

-
- 17 Crandall, E.D., Sbrocco, E.J., DeBoer, T.S., Barber, P.H., Carpenter, K.E.
Expansion dating: Calibrating molecular clocks in marine species from expansions onto the Sunda Shelf following the Last Glacial Maximum ([Open Access](#))
- (2012) *Molecular Biology and Evolution*, 29 (2), pp. 707-719. Cited 100 times.
doi: 10.1093/molbev/msr227
- [View at Publisher](#)
-
- 18 Danecek, P., Auton, A., Abecasis, G., Albers, C.A., Banks, E., DePristo, M.A., Handsaker, R.E., (...), Durbin, R.
The variant call format and VCFtools ([Open Access](#))
- (2011) *Bioinformatics*, 27 (15), art. no. btr330, pp. 2156-2158. Cited 4892 times.
doi: 10.1093/bioinformatics/btr330
- [View at Publisher](#)
-
- 19 Davison, G.W., Ng, P.K., Ho, H.C.
(2008) *The Singapore red data book: Threatened plants & animals of Singapore*. Cited 64 times.
Nature Society
-
- 20 Di Nitto, D., Neukermans, G., Koedam, N., Defever, H., Pattyn, F., Kairo, J.G., Dahdouh-Guebas, F.
Mangroves facing climate change: Landward migration potential in response to projected scenarios of sea level rise ([Open Access](#))
- (2014) *Biogeosciences*, 11 (3), pp. 857-871. Cited 52 times.
doi: 10.5194/bg-11-857-2014
- [View at Publisher](#)
-
- 21 Do, C., Waples, R.S., Peel, D., Macbeth, G.M., Tillett, B.J., Ovenden, J.R.
NeEstimator v2: Re-implementation of software for the estimation of contemporary effective population size (N_e) from genetic data
- (2014) *Molecular Ecology Resources*, 14 (1), pp. 209-214. Cited 987 times.
doi: 10.1111/1755-0998.12157
- [View at Publisher](#)
-
- 22 Eckert, C.G., Samis, K.E., Loughheed, S.C.
Genetic variation across species' geographical ranges: The central-marginal hypothesis and beyond
- (2008) *Molecular Ecology*, 17 (5), pp. 1170-1188. Cited 1013 times.
doi: 10.1111/j.1365-294X.2007.03659.x
- [View at Publisher](#)
-
- 23 Frankham, R.
La relacion entre la variacion genetica y el tamano poblacional en vida silvestre ([Open Access](#))
- (1996) *Conservation Biology*, 10 (6), pp. 1500-1508. Cited 1007 times.
doi: 10.1046/j.1523-1739.1996.10061500.x
- [View at Publisher](#)
-

- 24 Frankham, R., Bradshaw, C.J.A., Brook, B.W.
Genetics in conservation management: Revised recommendations for the 50/500 rules, Red List criteria and population viability analyses
(2014) *Biological Conservation*, 170, pp. 56-63. Cited 427 times.
doi: 10.1016/j.biocon.2013.12.036
View at Publisher
-
- 25 Gagnaire, P.-A.
Comparative genomics approach to evolutionary process connectivity (Open Access)
(2020) *Evolutionary Applications*, 13 (6), pp. 1320-1334. Cited 10 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1752-4571](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1752-4571)
doi: 10.1111/eva.12978
View at Publisher
-
- 26 Gagnaire, P.-A., Broquet, T., Aurelle, D., Viard, F., Souissi, A., Bonhomme, F., Arnaud-Haond, S., (...), Bierne, N.
Using neutral, selected, and hitchhiker loci to assess connectivity of marine populations in the genomic era (Open Access)
(2015) *Evolutionary Applications*, 8 (8), pp. 769-786. Cited 135 times.
http://www.blackwellpublishing.com/eva_enhanced/
doi: 10.1111/eva.12288
View at Publisher
-
- 27 Giri, C., Ochieng, E., Tieszen, L.L., Zhu, Z., Singh, A., Loveland, T., Masek, J., (...), Duke, N.
Status and distribution of mangrove forests of the world using earth observation satellite data
(2011) *Global Ecology and Biogeography*, 20 (1), pp. 154-159. Cited 1445 times.
doi: 10.1111/j.1466-8238.2010.00584.x
View at Publisher
-
- 28 Hoban, S.M., Hauffe, H.C., Pérez-Espona, S., Arntzen, J.W., Bertorelle, G., Bryja, J., Frith, K., (...), Bruford, M.W.
Bringing genetic diversity to the forefront of conservation policy and management (Open Access)
(2013) *Conservation Genetics Resources*, 5 (2), pp. 593-598. Cited 81 times.
<http://www.springerlink.com.ezlib.iium.edu.my/content/121433/>
doi: 10.1007/s12686-013-9859-y
View at Publisher
-
- 29 Hollenbeck, C.M., Portnoy, D.S., Gold, J.R.
A method for detecting recent changes in contemporary effective population size from linkage disequilibrium at linked and unlinked loci (Open Access)
(2016) *Heredity*, 117 (4), pp. 207-216. Cited 36 times.
<http://www.nature.com/hdy/index.html>
doi: 10.1038/hdy.2016.30
View at Publisher
-

- 30 Jenkins, D.G., Brescacin, C.R., Duxbury, C.V., Elliott, J.A., Evans, J.A., Grablow, K.R., Hillegass, M., (...), Williams, S.E.

Does size matter for dispersal distance?

(2007) *Global Ecology and Biogeography*, 16 (4), pp. 415-425. Cited 201 times.
doi: 10.1111/j.1466-8238.2007.00312.x

[View at Publisher](#)

- 31 Jiang, J., DeAngelis, D.L., Teh, S.-Y., Krauss, K.W., Wang, H., Li, H., Smith, T.J., (...), Koh, H.-L.

Defining the next generation modeling of coastal ecotone dynamics in response to global change ([Open Access](#))

(2016) *Ecological Modelling*, 326, pp. 168-176. Cited 23 times.
www.elsevier.com/inca/publications/store/5/0/3/3/0/6
doi: 10.1016/j.ecolmodel.2015.04.013

[View at Publisher](#)

- 32 John, A., Shin, P.K.S., Botton, M.L., Gauvry, G., Cheung, S.G., Laurie, K.

Conservation of Asian horseshoe crabs on spotlight ([Open Access](#))

(2021) *Biodiversity and Conservation*, 30 (1), pp. 253-256. Cited 5 times.
<http://www.springerlink.com.ezlib.iium.edu.my/content/0960-3115>
doi: 10.1007/s10531-020-02078-3

[View at Publisher](#)

- 33 John, B.A., Nelson, B.R., Sheikh, H.I., Cheung, S.G., Wardiatno, Y., Dash, B.P., Tsuchiya, K., (...), Pati, S.

A review on fisheries and conservation status of Asian horseshoe crabs ([Open Access](#))

(2018) *Biodiversity and Conservation*, 27 (14), pp. 3573-3598. Cited 40 times.
<http://www.springerlink.com.ezlib.iium.edu.my/content/0960-3115>
doi: 10.1007/s10531-018-1633-8

[View at Publisher](#)

- 34 Jombart, T., Devillard, S., Balloux, F.
Discriminant analysis of principal components: A new method for the analysis of genetically structured populations ([Open Access](#))

(2010) *BMC Genetics*, 11, art. no. 94. Cited 2505 times.
<http://www.biomedcentral.com/1471-2156/11/94>
doi: 10.1186/1471-2156-11-94

[View at Publisher](#)

- 35 Kamvar, Z.N., Tabima, J.F., Grünwald, N.J.
Poppr: An R package for genetic analysis of populations with clonal, partially clonal, and/or sexual reproduction ([Open Access](#))

(2014) *PeerJ*, 2014 (1), pp. 1-14. Cited 857 times.
<https://peerj.com/articles/281.pdf>
doi: 10.7717/peerj.281

[View at Publisher](#)

- 36 Keis, M., Remm, J., Ho, S.Y.W., Davison, J., Tammeleht, E., Tumanov, I.L., Saveljev, A.P., (...), Saarma, U.
Complete mitochondrial genomes and a novel spatial genetic method reveal cryptic phylogeographical structure and migration patterns among brown bears in north-western Eurasia
(2013) *Journal of Biogeography*, 40 (5), pp. 915-927. Cited 56 times.
doi: 10.1111/jbi.12043
[View at Publisher](#)
-
- 37 King, T.L., Eackles, M.S., Spidle, A.P., Brockmann, H.J.
Regional differentiation and sex-biased dispersal among populations of the horseshoe crab *Limulus polyphemus*
(2005) *Transactions of the American Fisheries Society*, 134 (2), pp. 441-465. Cited 56 times.
doi: 10.1577/T04-023.1
[View at Publisher](#)
-
- 38 Laikre, L.
Genetic diversity is overlooked in international conservation policy implementation
(2010) *Conservation Genetics*, 11 (2), pp. 349-354. Cited 96 times.
doi: 10.1007/s10592-009-0037-4
[View at Publisher](#)
-
- 39 Leprieur, F., Colosio, S., Descombes, P., Parravicini, V., Kulbicki, M., Cowman, P.F., Bellwood, D.R., (...), Pellissier, L.
Historical and contemporary determinants of global phylogenetic structure in tropical reef fish faunas ([Open Access](#))
(2016) *Ecography*, 39 (9), pp. 825-835. Cited 15 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1600-0587/issues](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1600-0587/issues)
doi: 10.1111/ecog.01638
[View at Publisher](#)
-
- 40 Li, H.
(2013) *Aligning sequence reads, clone sequences and assembly contigs with BWA-MEM*. Cited 3645 times.
ArXiv Preprint
-
- 41 Liew, P.L., Ng, W.L., Tan, S.G.
Levels and patterns of genetic variation in an Asian horseshoe crab species, *Tachypleus gigas* Müller, from the Malay Peninsula
(2015) *Marine Biology Research*, 11 (8), pp. 879-886. Cited 7 times.
<http://www.tandf.co.uk/journals/titles/17451000.asp>
doi: 10.1080/17451000.2015.1024135
[View at Publisher](#)
-
- 42 Ludt, W.B., Rocha, L.A.
Shifting seas: The impacts of Pleistocene sea-level fluctuations on the evolution of tropical marine taxa ([Open Access](#))
(2015) *Journal of Biogeography*, 42 (1), pp. 25-38. Cited 114 times.
<http://www.blackwellpublishing.com/journals/JBI>
doi: 10.1111/jbi.12416
[View at Publisher](#)

- 43 Miller, T.E.X., Angert, A.L., Brown, C.D., Lee-Yaw, J.A., Lewis, M., Lutscher, F., Marculis, N.G., (...), Williams, J.L.
Eco-evolutionary dynamics of range expansion ([Open Access](#))
(2020) *Ecology*, 101 (10), art. no. e03139. Cited 7 times.
<http://esajournals.onlinelibrary.wiley.com.ezlib.iium.edu.my/hub/journal/10.1002/%28ISSN%291939-9170/issues/doi:10.1002/ecy.3139>
View at Publisher
-
- 44 Nadeau, C.P., Urban, M.C.
Eco-evolution on the edge during climate change
(2019) *Ecography*, 42 (7), pp. 1280-1297. Cited 44 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1600-0587](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1600-0587)
doi: 10.1111/ecog.04404
View at Publisher
-
- 45 Ni, G., Li, Q., Kong, L., Yu, H.
Comparative phylogeography in marginal seas of the northwestern Pacific ([Open Access](#))
(2014) *Molecular Ecology*, 23 (3), pp. 534-548. Cited 98 times.
doi: 10.1111/mec.12620
View at Publisher
-
- 46 Nossa, C.W., Havlak, P., Yue, J.-X., Lv, J., Vincent, K.Y., Brockmann, H.J., Putnam, N.H.
Joint assembly and genetic mapping of the Atlantic horseshoe crab genome reveals ancient whole genome duplication ([Open Access](#))
(2014) *GigaScience*, 3 (1), art. no. 9. Cited 61 times.
<http://www.gigasciencejournal.com/content/3/1/9>
doi: 10.1186/2047-217X-3-9
View at Publisher
-
- 47 Palstra, F.P., Ruzzante, D.E.
Genetic estimates of contemporary effective population size: What can they tell us about the importance of genetic stochasticity for wild population persistence?
(2008) *Molecular Ecology*, 17 (15), pp. 3428-3447. Cited 385 times.
doi: 10.1111/j.1365-294X.2008.03842.x
View at Publisher
-
- 48 Peakall, R., Smouse, P.E.
GENALEX 6: Genetic analysis in Excel. Population genetic software for teaching and research
(2006) *Molecular Ecology Notes*, 6 (1), pp. 288-295. Cited 9734 times.
doi: 10.1111/j.1471-8286.2005.01155.x
View at Publisher
-
- 49 Peter, B.M., Slatkin, M.
Detecting range expansions from genetic data ([Open Access](#))
(2013) *Evolution*, 67 (11), pp. 3274-3289. Cited 69 times.
doi: 10.1111/evo.12202
View at Publisher

- 50 Peterson, B.K., Weber, J.N., Kay, E.H., Fisher, H.S., Hoekstra, H.E.
Double digest RADseq: An inexpensive method for de novo SNP discovery and genotyping in model and non-model species ([Open Access](#))

(2012) *PLoS ONE*, 7 (5), art. no. e37135. Cited 1641 times.
<http://www.plosone.org/article/fetchObjectAttachment.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0037135&representation=PDF>
doi: 10.1371/journal.pone.0037135

View at Publisher
-
- 51 Pierce, J.C., Tan, G., Gaffney, P.M.
Delaware Bay and Chesapeake Bay populations of the horseshoe crab *Limulus polyphemus* are genetically distinct

(2000) *Estuaries*, 23 (5), pp. 690-698. Cited 45 times.
doi: 10.2307/1352895

View at Publisher
-
- 52 Purcell, S., Neale, B., Todd-Brown, K., Thomas, L., Ferreira, M.A.R., Bender, D., Maller, J., (...), Sham, P.C.
PLINK: A tool set for whole-genome association and population-based linkage analyses ([Open Access](#))

(2007) *American Journal of Human Genetics*, 81 (3), pp. 559-575. Cited 17130 times.
http://www.elsevier.com.ezlib.iium.edu.my/wps/find/journaldescription.cws_home/713561/description#description
doi: 10.1086/519795

View at Publisher
-
- 53 Robalo, J.I., Francisco, S.M., Vendrell, C., Lima, C.S., Pereira, A., Brunner, B.P., Dia, M., (...), Castilho, R.
Against all odds: a tale of marine range expansion with maintenance of extremely high genetic diversity ([Open Access](#))

(2020) *Scientific Reports*, 10 (1), art. no. 12707. Cited 4 times.
www.nature.com/srep/index.html
doi: 10.1038/s41598-020-69374-4

View at Publisher
-
- 54 Rochette, N.C., Catchen, J.M.
Deriving genotypes from RAD-seq short-read data using Stacks

(2017) *Nature Protocols*, 12 (12), pp. 2640-2659. Cited 149 times.
<http://www.natureprotocols.com/>
doi: 10.1038/nprot.2017.123

View at Publisher
-
- 55 Rudkin, D.M., Young, G.A., Nowlan, G.S.
The oldest horseshoe crab: A new xiphosurid from late ordovician konservat-lagerstätten deposits, Manitoba, Canada ([Open Access](#))

(2008) *Palaeontology*, 51 (1), pp. 1-9. Cited 109 times.
doi: 10.1111/j.1475-4983.2007.00746.x

View at Publisher

□ 56 Rudloe, A.
Locomotor and light responses of larvae of the horseshoe crab, *Limulus polyphemus* (L.)
(1979) *The Biological Bulletin*, 157 (3), pp. 494-505. Cited 54 times.

□ 57 Sekiguchi, K.
(1988) *Biology of horseshoe crabs*. Cited 121 times.
International Specialized Book Service Incorporated

□ 58 Sekiguchi, K., Sugita, H.
Systematics and hybridization in the four living species of horseshoe crabs
(1980) *Evolution*, 34 (4), pp. 712-718. Cited 32 times.
<https://doi-org.ezlib.iium.edu.my/10.1111/j.1558-5646.1980.tb04010.x>

□ 59 Sheaves, M.
Consequences of ecological connectivity: The coastal ecosystem mosaic ([Open Access](#))

(2009) *Marine Ecology Progress Series*, 391, pp. 107-115. Cited 191 times.
<http://www.int-res.com/articles/meps2009/391/m391p107.pdf>
doi: 10.3354/meps08121

[View at Publisher](#)

□ 60 Shingate, P., Ravi, V., Prasad, A., Tay, B.-H., Garg, K.M., Chattopadhyay, B., Yap, L.-M., (...), Venkatesh, B.
Chromosome-level assembly of the horseshoe crab genome provides insights into its genome evolution ([Open Access](#))

(2020) *Nature Communications*, 11 (1), art. no. 2322. Cited 17 times.
<http://www.nature.com/ncomms/index.html>
doi: 10.1038/s41467-020-16180-1

[View at Publisher](#)

□ 61 Shingate, P., Ravi, V., Prasad, A., Tay, B.-H., Venkatesh, B.
Chromosome-level genome assembly of the coastal horseshoe crab (*Tachypleus gigas*)

(2020) *Molecular Ecology Resources*, 20 (6), pp. 1748-1760. Cited 5 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1755-0998](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1755-0998)
doi: 10.1111/1755-0998.13233

[View at Publisher](#)

□ 62 Siswanto, E., Tanaka, K.
Phytoplankton biomass dynamics in the strait of malacca within the period of the seawifs full mission: Seasonal cycles, interannual variations and decadal-scale trends ([Open Access](#))

(2014) *Remote Sensing*, 6 (4), pp. 2718-2742. Cited 20 times.
<http://www.mdpi.com/2072-4292/6/4/2718/pdf>
doi: 10.3390/rs6042718

[View at Publisher](#)

- 63 Smouse, P.E., Peakall, R.
Spatial autocorrelation analysis of individual multiallele and multilocus genetic structure ([Open Access](#))

(1999) *Heredity*, 82 (5), pp. 561-573. Cited 850 times.
<http://www.nature.com/hdy/index.html>
doi: 10.1038/sj.hdy.6885180

View at Publisher
-
- 64 Srijaya, T.C., Pradeep, P.J., Mithun, S., Hassan, A., Shaharom, F., Chatterji, A.
A new record on the morphometric variations in the populations of horseshoe crab (*Carcinoscorpius rotundicauda* Latreille) obtained from two different ecological habitats of Peninsular Malaysia
(2010) *Our Nature*, 8 (1), pp. 204-211. Cited 24 times.
-
- 65 Stocker, T.F., Qin, D., Plattner, G.-K., Tignor, M., Allen, S.K., Boschung, J., Nauels, A., (...), Midgley, P.M.
(2013) *Climate change 2013: The physical science basis*, p. 1535. Cited 9992 times.
Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change
-
- 66 Tan, A.N., Christianus, A., Shakibazadeh, S., Hajeb, P.
Horseshoe crab, *Tachypleus gigas* (Müller, 1785) spawning population at Balok Beach, Kuantan, Pahang, Malaysia

(2012) *Pakistan Journal of Biological Sciences*, 15 (13), pp. 610-620. Cited 15 times.
<http://scialert.net/qredirect.php?doi=pjbs.2012.610.620&linkid=pdf>
doi: 10.3923/pjbs.2012.610.620

View at Publisher
-
- 67 Tozer, B., Sandwell, D.T., Smith, W.H.F., Olson, C., Beale, J.R., Wessel, P.
Global Bathymetry and Topography at 15 Arc Sec: SRTM15+ ([Open Access](#))

(2019) *Earth and Space Science*, 6 (10), pp. 1847-1864. Cited 107 times.
[http://agupubs.onlinelibrary.wiley.com.ezlib.iium.edu.my/agu/journal/10.1002/\(ISSN\)2333-5084/http://agupubs.onlinelibrary.wiley.com.ezlib.iium.edu.my/hub/journal/10.1002/\(ISSN\)2333-5084/](http://agupubs.onlinelibrary.wiley.com.ezlib.iium.edu.my/agu/journal/10.1002/(ISSN)2333-5084/http://agupubs.onlinelibrary.wiley.com.ezlib.iium.edu.my/hub/journal/10.1002/(ISSN)2333-5084/)
doi: 10.1029/2019EA000658

View at Publisher
-
- 68 van Etten, J.
R package gdistance: Distances and routes on geographical grids ([Open Access](#))

(2017) *Journal of Statistical Software*, 76 (1). Cited 160 times.
<https://www.jstatsoft.org/index.php/jss/article/view/v076i01/v76i13.pdf>
doi: 10.18637/jss.v076.i13

View at Publisher
-
- 69 Vestbo, S., Obst, M., Fernandez, F.J.Q., Intanai, I., Funch, P.
Present and potential future distributions of Asian horseshoe crabs determine areas for conservation ([Open Access](#))

(2018) *Frontiers in Marine Science*, 5 (MAY), art. no. 164. Cited 24 times.
<https://www.frontiersin.org/articles/10.3389/fmars.2018.00164/full>
doi: 10.3389/fmars.2018.00164

View at Publisher

- 70 Wagner, G.P., Booth, G., Bagheri-Chaichian, H.
A population genetic theory of canalization ([Open Access](#))
(1997) *Evolution*, 51 (2), pp. 329-347. Cited 376 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/\(ISSN\)1558-5646](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1111/(ISSN)1558-5646)
doi: 10.1111/j.1558-5646.1997.tb02420.x
View at Publisher
-
- 71 Waples, R.S.
Making sense of genetic estimates of effective population size
(2016) *Molecular Ecology*, 25 (19), pp. 4689-4691. Cited 26 times.
<http://www.blackwellpublishing.com/journals/MEC>
doi: 10.1111/mec.13814
View at Publisher
-
- 72 Waples, R.S., Antao, T., Luikart, G.
Effects of overlapping generations on linkage disequilibrium estimates of effective population size ([Open Access](#))
(2014) *Genetics*, 197 (2), pp. 769-780. Cited 189 times.
<http://www.genetics.org/content/197/2/769.full.pdf>
doi: 10.1534/genetics.114.164822
View at Publisher
-
- 73 Waples, R.K., Larson, W.A., Waples, R.S.
Estimating contemporary effective population size in non-model species using linkage disequilibrium across thousands of loci ([Open Access](#))
(2016) *Heredity*, 117 (4), pp. 233-240. Cited 89 times.
<http://www.nature.com/hdy/index.html>
doi: 10.1038/hdy.2016.60
View at Publisher
-
- 74 Yang, A., Dick, C.W., Yao, X., Huang, H.
Impacts of biogeographic history and marginal population genetics on species range limits: A case study of *Liriodendron chinense* ([Open Access](#))
(2016) *Scientific Reports*, 6, art. no. 25632. Cited 33 times.
www.nature.com/srep/index.html
doi: 10.1038/srep25632
View at Publisher
-
- 75 Yang, M.-C., Chen, C.-P., Hsieh, H.-L., Huang, H., Chen, C.A.
Phylogeography, demographic history, and reserves network of horseshoe crab, *Tachypleus tridentatus*, in the south and east China Seaboards
(2009) *Biology and Conservation of Horseshoe Crabs*, pp. 163-181. Cited 18 times.
<http://springerlink.com.ezlib.iium.edu.my/openurl.asp?genre=book&isbn=978-0-387-89958-9>
ISBN: 978-038789958-9
doi: 10.1007/978-0-387-89959-6_10
View at Publisher

76 Zheng, X., Levine, D., Shen, J., Gogarten, S.M., Laurie, C., Weir, B.S.

A high-performance computing toolset for relatedness and principal component analysis of SNP data ([Open Access](#))

(2012) *Bioinformatics*, 28 (24), pp. 3326-3328. Cited 877 times.

doi: 10.1093/bioinformatics/bts606

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Rheindt, F.E.; Department of Biological Sciences, National University of Singapore, Singapore City, Singapore; email:mcbbv@imcb.a-star.edu.sg

Venkatesh, B.; Institute of Molecular and Cell Biology, A*STAR, Biopolis, Singapore City, Singapore; email:mcbbv@imcb.a-star.edu.sg

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