

## Short Note

# Group Sizes of Indo-Pacific Humpback Dolphins in Waters Southwest of Hainan Island, China: Insights into Rare Records of Large Groups

## Supplemental Table

Mingming Liu,<sup>1,2,3#</sup> Mingli Lin,<sup>1#</sup> Lijun Dong,<sup>1</sup> Tianfei Xue,<sup>1</sup> Peijun Zhang,<sup>1</sup>  
Xiaoming Tang,<sup>1,2</sup> and Songhai Li<sup>1,4\*</sup>

<sup>1</sup>Marine Mammal and Marine Bioacoustics Laboratory, Institute of Deep-sea Science and Engineering,  
Chinese Academy of Sciences, Sanya, Hainan 572000, China

<sup>2</sup>University of Chinese Academy of Sciences, Beijing 100049, China

<sup>3</sup>School of Biological Sciences, University of Aberdeen, Aberdeen AB24 2TZ, UK

<sup>4</sup>Tropical Marine Science Institute, National University of Singapore, 18 Kent Ridge Road, 119227, Singapore

#These authors contributed equally to this work.

\*E-mail: lish@idsse.ac.cn

**Table S1.** Review of group size estimates of humpback dolphins (*Sousa* spp.) from published literature; NA = not available.

Species	Survey location	Survey year	Method	No. of sampled groups	Group size mean ( $\pm$ SD/SE*)	Range	References
<i>S. chinensis</i>	Aizhou, China	1990s	Observers' counts	NA	8.7	NA	Qiu & Chen, 2004; Chen et al., 2011
	Chennai coast, Bay of Bengal	2011	Observers' counts	4	20	10-30	Muralidharan, 2013
	Cowie Bay, Sabah, Malaysia	NA	Observers' counts	NA	2	1-4	Jaaman, 2006
	Donsak, Thailand	2011-2013	Photo-ID	89	4.7 $\pm$ 3.4	1-18	Jutapruet et al., 2015
	Eastern Taiwan Strait, China	2007-2010	Photo-ID	121	7.7	1-31	Dungan et al., 2016
	Eastern Taiwan Strait, China	2007-2010	Photo-ID	95	7 $\pm$ 6.61	1-31	Wang et al., 2012
	Eastern Taiwan Strait, China	2007-2012	Observers' counts	221	6.2 $\pm$ 5.9	1-31	Dares et al., 2014; Dares, 2019
	Eastern Taiwan Strait, China	2007-2012	Photo-ID	NA	7.6 $\pm$ 5.9	1-41	Dares et al., 2014
	Eastern Taiwan Strait, China	2013	Observers' counts	27	5.3 $\pm$ 3.9	1-NA	Hoffman, 2015
	Eastern Taiwan Strait, China	2007-2010	Photo-ID	119	7.86 $\pm$ 0.61*	1-31	Dungan, 2011; Wright, 2014
	Hong Kong, China	1990s	Observers' counts	1,396	3.8 $\pm$ 3.63	1-23	Jefferson, 2000
	Hong Kong, China	2005-2014	NA	NA	3.7 $\pm$ 3.17	1-30	Würsig et al., 2016
	Hong Kong, China	NA	Observers' counts	NA	3.1 $\pm$ 1.46	1-7	Parsons, 1998
	Hong Kong, China	NA	Observers' counts	NA	2.6 $\pm$ 2.55	1-13	Parsons, 1998
	Hong Kong, Lantau Island, China	2010-2011	Observers' counts	12	9.2 $\pm$ 2.6	1-NA	Hoffman, 2015
	Hong Kong, China	2010-2014	Photo-ID	1,362	4.58 $\pm$ 3.65	1-30	Or, 2017
	Hong Kong, China	1996-2005	Observers' counts	4,822	4.5 $\pm$ 4.34	1-44	Hung, 2008
	Hong Kong, Tai O Peninsula, China	2012-2014	Land-based counts	393	NA	1-8	Wong, 2017
	Jambongan, Sabah, Malaysia	NA	Observers' counts	NA	NA	2-6	Jaaman et al., 1997
	Khanom, Thailand	2008-2009	Photo-ID	39	NA	2-20	Jaroensutasinee et al., 2011
	Koh Kong Bay, Cambodia	2001	Observers' counts	4	6 $\pm$ 2.87	2-8	Beasley & Davidson, 2007
	Kuching Bay, Sarawak, Malaysia	2010-2011	Photo-ID	16	18 $\pm$ 13.33	7-45	Poh et al., 2016
	Leizhou Bay, Zhanjiang, China	2005	Photo-ID	96	8	1-27	Zhou et al., 2007
	Leizhou Bay, Zhanjiang, China	2006-2007	Photo-ID	118	7.5 $\pm$ 5.45	1-23	Xu et al., 2012
	Leizhou Bay, Zhanjiang, China	2005-2012	Photo-ID	611	8.12 $\pm$ 5.85	1-35	Xu et al., 2015
	Leizhou Bay, Zhanjiang, China	2013-2018	Observers' counts	253	9.4 $\pm$ 7.2	1-48	Liu et al., 2020
	Lingding Bay, China	1990s	Observers' counts	178	8.3 $\pm$ 7.84	1-44	Jefferson, 2000
	Lingding Bay, China	1990s	Observers' counts	NA	7.2	NA	Jia et al., 2000; Chen et al., 2011
	Macau, China	1990s	Observers' counts	NA	8.5	NA	Qiu & Chen, 2004; Chen et al., 2011
	Matang and Langkawi, Malaysia	2014	Observers' counts	7	NA	3-31	Hoffman et al., 2015
	Moyang River Estuary	2013-2015	Observers' counts	79	8.0 $\pm$ 6.8	1-30	Li et al., 2019
	Ningde, China	2009-2010	Photo-ID	6	1.67	1-2	Chen et al., 2012
	Ningde, China	2011-2013	Photo-ID	7	3.14 $\pm$ 5.85	1-6	Wu et al., 2014
	North Lantau, Hong Kong, China	1990s	Observers' counts	NA	3.6	NA	Jefferson & Leatherwood, 1997; Chen et al., 2011
	North Lingding Bay, China	1990s	Observers' counts	NA	4.4	NA	Qiu & Chen, 2004; Chen et al., 2011
	Northern Bay of Bengal, Bangladesh	2004	Observers' counts	6	16.2 $\pm$ 21.9	2-55	Smith et al., 2008

Species	Survey location	Survey year	Method	No. of sampled groups	Group size mean ( $\pm$ SD/SE*)	Range	References
	Northern Beibu Gulf, China	2004	Observers' counts	8	4.9	1-10	Wang, 2006
	Northern Beibu Gulf, China	2003-2004	Observers' counts	11	6.2	1-12	Wang, 2006
	Northern Beibu Gulf, China	2003-2004	Observers' counts	19	5.63	NA	Chen et al., 2009
	Northern Beibu Gulf, Saniang Bay, China	2011	Observers' counts	13	NA	2->15	Wang et al., 2013
	Northern Beibu Gulf, Saniang Bay, China	2013-2016	Photo-ID	155	6.45 $\pm$ 4.44	1-22	Yan, 2016
	Northern Beibu Gulf, Saniang Bay, China	2013-2016	Photo-ID	164	6.39 $\pm$ 4.43	1-22	Peng et al., 2019
	Pearl River Estuary, China	2000-2009	Photo-ID	1,243	6.49 $\pm$ 1.77*	1-30	Dungan, 2011; Dungan et al., 2012; Wright, 2014
	Sesayap Delta, Kalimantan, Indonesia	NA	Observers' counts	NA	NA	6-15	Minton et al., 2016
	Southwest water off Hainan, China	2014	Observers' counts	6	NA	12-40	Li et al., 2016
	Western Pearl River Estuary, China	2007-2008	Observers' counts	153	6.1	1-33	Chen et al., 2011
	Weitou Bay, China	2013	Observers' counts	26	4.3 $\pm$ 2.7	1-9	Wu et al., 2019
	Xiamen, China	2010-2015	Observers' counts	157	5.47 $\pm$ 3.11	1-16	Wang et al., 2016
	Xiamen, China	2010-2013	Photo-ID	143	5.6 $\pm$ 3.4	1-16	Wang et al., 2015
	Xiamen, China	2006-2007	Photo-ID	41	5.24 $\pm$ 4.49	1-20	Chen, 2007
	Xiamen, China	2004	Observers' counts	102	4.64 $\pm$ 3.85	1-18	Chen et al., 2008
	Xiamen, China	2004-2007	Observers' counts	208	5.42	NA	Chen et al., 2009
	Xiamen, China	2007-2010	Photo-ID	76	7.2	NA	Chen et al., 2018
<i>S. sahulensis</i>	Amity Point, Australia	1999	Observers' counts	48	5 $\pm$ 1*	1-10	Van Parijs & Corkeron, 2001
	Arguni Bay, West Papua	2015	Photo-ID	64	2 $\pm$ 1.4	1-7	Beasley et al., 2016
	Capricorn Coast, Australia	2006-2008	Observers' counts	365	3.8 $\pm$ 2.78	1-12	Cagnazzi, 2010; Cagnazzi et al., 2011
	Cleveland Bay, Australia	1999-2002	Photo-ID	135	3.5 $\pm$ 0.19*	1-12	Parra, 2005; Parra et al., 2011
	Exmouth Gulf, North West Cape, Western Australia	2013	Observers' counts	27	NA	1-5	de Freitas et al., 2015
	Exmouth Gulf, North West Cape, Western Australia	NA	Observers' counts	84	2 $\pm$ 1.6	1-7	Hanf, 2015
	Great Sandy Strait, Australia	2004-2006	Photo-ID	156	5.1 $\pm$ 3.84	1-19	Roos, 2006
	Kikori Delta, Papua New Guinea	NA	Observers' counts	NA	NA	2-5	Beasley et al., 2015
	Moreton Bay, Australia	NA	Observers' counts	NA	2.4 $\pm$ 1.13	1-9	Corkeron, 1990
	Moreton Bay, Australia	2008-2010	Observers' counts	46	2	1-10	Berg Soto et al., 2014
	Moreton Bay, Australia	2014-2015	Photo-ID	58	4.2 $\pm$ 0.6*	1-31	Pogson-Manning, 2015
	North West Cape, Western Australia	2010	Photo-ID and observers' counts	42	5.3 $\pm$ 0.48*	1-15	Brown et al., 2012
	North West Cape, Western Australia	2013-2015	Observers' counts	145	4.6 $\pm$ 3.2	1-19	Hunt et al., 2017, 2019
	Stradbroke Island, Moreton Bay, Australia	1999	Observers' counts	81	NA	1-15	Van Parijs et al., 2002
<i>S. plumbea</i>	Algoa Bay, South Africa	1991-1994	Photo-ID, land-based and observers' counts	113	7 $\pm$ 2.52	1-24	Karczmarski, 1996, 1999, 2000; Karczmarski et al., 1999
	Algoa Bay, South Africa	2010-2011	Land-based counts	157	3 $\pm$ 2.35	1-13	Koper et al., 2016
	Algoa Bay, South Africa	2008-2011	Photo-ID	50	3.1	1-23	Bouveroux et al., 2018; Melly et al., 2018

Species	Survey location	Survey year	Method	No. of sampled groups	Group size mean ( $\pm$ SD/SE*)	Range	References
	Anakao, Madagascar	NA	Observers' counts	NA	3.6 $\pm$ 2.7	1-9	Cerchio et al., 2015
	Arabian Gulf, Kuwait	2006-2009	Observers' counts	NA	7	3-15	Nithyanandan, 2010
	Arabian Gulf, Oman	NA	Observers' counts	110	11.7 $\pm$ 14.6	1-100	Baldwin et al., 2004
	Ashtamudi Estuary, India	2010-2011	Observers' counts	NA	3	1-5	Bijukumar & Smrithy, 2012
	Boubyan Island, Kuwait	2004-2005	Observers' counts	159	3.3	1-30	Bishop & Alsaifar, 2008
	Cochin backwaters, EEZ, India	2003-2007	Observers' counts	18	3.6	1-20	Afsal et al., 2008
	Emirate of Abu Dhabi, UAE	2014-2015	Observers' counts	54	6.8 $\pm$ 1.7*	1-24	López et al., 2018
	Goa, India	1998	Observers' counts	27	2.6 $\pm$ 2.12	1-9	Parsons, 1998
	Goa, India	2001-2002	Observers' counts	135	6.3 $\pm$ 7.1	1-35	Sutaria & Jefferson, 2004
	Gulf of Kachchh, India	2001-2002	Observers' counts	21	3.9 $\pm$ 3.3	1-11	Sutaria & Jefferson, 2004
	Indus River Delta, Pakistan	2005-2009	Observers' counts	111	3.92 $\pm$ 4.6	1-35	Kiani, 2014; Kiani & Van Waerebeek, 2015
	Kochi harbor, India	2016	Observers' counts	85	2.38 $\pm$ 0.18*	1-8	Panicker et al., 2019
	Maputo Bay, Mozambique	1995-1997	Photo-ID	37	14.9 $\pm$ 7.32	2-25	Guissamulo & Cockcroft, 2004
	Menai Bay, Zanzibar	2015	Photo-ID	21	3 (median)	1-7	Sharpe & Berggren, 2019
	Mossel Bay, South Africa	2011-2013	Photo-ID	31	4.9	1-15	James et al., 2015
	Northern Red Sea Basin	NA	Observers' counts	27	2.2 $\pm$ 1.3	1-5	Notarbartolo di Sciara et al., 2017
	Nosy Be Region, Madagascar	NA	Observers' counts	126	5.9 $\pm$ 4.2	1-22	Cerchio et al., 2015
	Nosy Iranja, Madagascar	NA	Observers' counts	NA	7.1	1-16	Cerchio et al., 2015
	Persian Gulf, Iran	2014-2016	Observers' counts	75	2.71	1-15	Hemami et al., 2018
	Plettenberg Bay, South Africa	NA	Observers' counts	NA	6 $\pm$ 1.4*	1-25	Saayman & Tayler, 1973
	Plettenberg Bay, South Africa	NA	Observers' counts	NA	6.5 $\pm$ 0.38*	1-25	Saayman & Tayler, 1979
	Plettenberg Bay, South Africa	NA	Observers' counts	NA	6.8 $\pm$ 1.94*	1- NA	Findlay et al., 1992
	Plettenberg Bay, South Africa	2002-2003	Photo-ID	35	5	2-20	Jobson, 2006
	Plettenberg Bay, South Africa	2014-2015	Photo-ID	98	3.94 $\pm$ 0.28*	1-12	Bouveroux et al., 2019
	Richards Bay, South Africa	1998	Photo-ID	56	NA	1-20	Keith et al., 2002
	Richards Bay, South Africa	1998-2000	Photo-ID	30	5.1	1-20	Atkins & Atkins, 2002
	Sindhudurg Coast of Maharashtra, India	2014-2016	Observers' counts	11	30.4 $\pm$ 27.8	4-110	Bopardikar et al., 2018
	Sonmiani Bay, Pakistan	2011-2012	Observers' counts	36	11.9 $\pm$ 13.6	1-68	Kiani & Van Waerebeek, 2015
	Southern Red Sea Basin	NA	Observers' counts	33	4.1 $\pm$ 3.2	1-15	Notarbartolo di Sciara et al., 2017
<i>S. teuszii</i>	Angolan	NA	Observers' counts	75	3.7 $\pm$ 0.33*	1-8	Weir & Collins, 2015
	Flamingos, Angola	2008	Photo-ID	71	2	1-8	Weir, 2009
	Guinea-Bissau waters	2008-2014	Observers' counts	56	6.03	1-25	Leeney et al., 2016
	Guinea-Bissau waters	NA	Observers' counts	53	4.06	1-10	Spaans, 1990
	Guinea-Bissau waters	NA	Observers' counts	24	6.21	1-20	Wolff, 1998
	Gulf of Guinea Central	NA	Observers' counts	13	10.2 $\pm$ 0.43*	2-45	Weir & Collins, 2015
	Gulf of Guinea South	NA	Observers' counts	363	13.1 $\pm$ 0.43*	1-43	Weir & Collins, 2015
	Gulf of Guinea West	NA	Observers' counts	117	6.5 $\pm$ 0.51*	1-25	Weir & Collins, 2015

Species	Survey location	Survey year	Method	No. of sampled groups	Group size mean ( $\pm$ SD/SE*)	Range	References
	Saharan Upwelling	NA	Observers' counts	15	6.3 $\pm$ 1.52*	1-17	Weir & Collins, 2015
	Sahelian Upwelling	NA	Observers' counts	151	7.4 $\pm$ 0.64*	1-40	Weir & Collins, 2015
	Río Nuñez Estuary, Guinea	2013	Photo-ID	8	12.1 $\pm$ 11.5	1-25	Weir, 2015
	Saloum Delta, Senegal	1999-2000	Observers' counts	8	23	10-37	Van Waerebeek et al., 2004

## Literature Cited

- Afsal, V. V., Yousuf, K. S. S. M., Anoop, B., Anoop, A. K., Kannan, P., Rajagopalan, M., & Vivekanandan, E. (2008). A note on cetacean distribution in the Indian EEZ and contiguous seas during 2003-07. *Journal of Cetacean Research and Management*, 10(3), 209-216.
- Atkins, S., & Atkins, B. L. (2002). *Abundance and site fidelity of Indo-Pacific humpback dolphins (Sousa chinensis) at Richards Bay, South Africa* (Scientific Committee Report SC/Q20 54/SM25). International Whaling Commission.
- Baldwin, R. M., Collins, M., Van Waerebeek, K., & Minton, G. (2004). The Indo-Pacific humpback dolphin of the Arabian region: A status review. *Aquatic Mammals*, 30(1), 111-124. <https://doi.org/10.1578/AM.30.1.2004.111>
- Beasley, I., & Davidson, P. (2007). Conservation status of marine mammals in Cambodian waters, including seven new cetacean records of occurrence. *Aquatic Mammals*, 33(3), 368-379. <https://doi.org/10.1578/AM.33.3.2007.368>
- Beasley, I., Golding, M., & Anamiato, J. (2015). *Looking for Pidu (dolphins and dugongs) in the Kikori Delta of Papua New Guinea—February 2015*. College of Marine and Environmental Sciences, James Cook University. (Unpublished report available from IB)
- Beasley, I., Jedensjö, M., Wijaya, G. M., Anamiato, J., Kahn, B., & Krebs, D. (2016). Observations on Australian humpback dolphins (*Sousa sahulensis*) in waters of the Pacific Islands and New Guinea. *Advances in Marine Biology*, 73, 219-271. <https://doi.org/10.1016/bs.amb.2015.08.003>
- Berg Soto, A., Marsh, H., Everingham, Y., Smith, J. N., Parra, G. J., & Noad, M. (2014). Discriminating between the vocalizations of Indo-Pacific humpback and Australian snubfin dolphins in Queensland, Australia. *The Journal of the Acoustical Society of America*, 136(2), 930-938. <https://doi.org/10.1121/1.4884772>
- Bijukumar, A., & Smrithy, R. (2012). Behaviour of Indo-Pacific humpback dolphin, *Sousa chinensis* (Osbeck) in the Ashtamudi Estuary, southwest coast of India. *Journal of the Marine Biological Association of India*, 54(2), 34.
- Bishop, J. M., & Alsaffar, A. H. (2008). Quantitative observations on marine mammals and reptiles of Kuwait's Boubyan Island. *Zoology in the Middle East*, 43(1), 3-12. <https://doi.org/10.1080/09397140.2008.10638263>
- Bopardikar, I., Sutaria, D., Sule, M., Jog, K., Patankar, V., & Klinck, H. (2018). Description and classification of Indian Ocean humpback dolphin (*Sousa plumbea*) whistles recorded off the Sindhudurg coast of Maharashtra, India. *Marine Mammal Science*, 34(3), 755-776. <https://doi.org/10.1111/mms.12479>
- Bouveroux, T. N., Caputo, M., Froneman, P. W., & Plön, S. (2018). Largest reported groups for the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) found in Algoa Bay, South Africa: Trends and potential drivers. *Marine Mammal Science*, 34(3), 645-665. <https://doi.org/10.1111/mms.12471>
- Bouveroux, T., Kirkman, S. P., Conry, D., Vargas-Fonseca, O. A., & Pistorius, P. A. (2019). The first assessment of social organisation of the Indian Ocean humpback dolphin (*Sousa plumbea*) along the south coast of South Africa. *Canadian Journal of Zoology*, 97(10), 855-865. <https://doi.org/10.1139/cjz-2018-0244>
- Brown, A., Bejder, L., Cagnazzi, D., Parra, G. J., & Allen, S. J. (2012). The North West Cape, Western Australia: A potential hotspot for Indo-Pacific humpback dolphins *Sousa chinensis*? *Pacific Conservation Biology*, 18(4), 240-246. <https://doi.org/10.1071/PC120240>
- Cagnazzi, D. (2010). *Conservation status of Australian snubfin dolphin, Orcaella heinsohni, and Indo-Pacific humpback dolphin, Sousa chinensis, in the Capricorn coast, central Queensland, Australia* (Thesis). Southern Cross University, Lismore, Australia.
- Cagnazzi, D. D. B., Harrison, P. L., Ross, G. J., & Lynch, P. (2011). Abundance and site fidelity of Indo-Pacific humpback dolphins in the Great Sandy Strait, Queensland, Australia. *Marine Mammal Science*, 27(2), 255-281. <https://doi.org/10.1111/j.1748-7692.2009.00296.x>
- Cerchio, S., Andrianarivelo, N., & Andrianantenaina, B. (2015). Ecology and conservation status of Indian Ocean humpback dolphins (*Sousa plumbea*) in Madagascar. *Advances in Marine Biology*, 72, 163-199. <https://doi.org/10.1016/bs.amb.2015.09.004>
- Chen, B. (2007). *Population biology and conservation biology of Indo-Pacific humpback dolphin in Xiamen waters* (PhD thesis). Nanjing Normal University, Nanjing, China. (In Chinese)
- Chen, B. Y., Zheng, D. M., Wang, L., Xu, X. R., & Yang, G. (2012). The northernmost distribution of Indo-Pacific humpback dolphin (*Sousa chinensis*) in the world: Evidence from preliminary survey in Ningde, China. *Pakistan Journal of Zoology*, 44(5).
- Chen, B., Zheng, D., Yang, G., Xu, X., & Zhou, K. (2009). Distribution and conservation of the Indo-Pacific humpback dolphin in China. *Integrative Zoology*, 4(2), 240-247. <https://doi.org/10.1111/j.1749-4877.2009.00160.x>
- Chen, B., Zheng, D., Zhai, F., Xu, X., Sun, P., Wang, Q., & Yang, G. (2008). Abundance, distribution and conservation of Chinese white dolphins (*Sousa chinensis*) in Xiamen, China. *Mammalian Biology*, 73(2), 156-164.
- Chen, B., Gao, H., Jefferson, T. A., Lu, Y., Wang, L., Li, S., Wang, H., Xu, X., & Yang, G. (2018). Survival rate and population size of Indo-Pacific humpback dolphins (*Sousa chinensis*) in Xiamen Bay, China. *Marine Mammal Science*, 34(4), 1018-1033. <https://doi.org/10.1111/mms.12510>
- Chen, T., Qiu, Y., Jia, X., Hung, S. K., & Liu, W. (2011). Distribution and group dynamics of Indo-Pacific humpback dolphins (*Sousa chinensis*) in the western Pearl River Estuary, China. *Mammalian Biology*, 76(1), 93-96. <https://doi.org/10.1016/j.mambio.2010.01.001>
- Corkeron, P. J. (1990). Aspects of the behavioral ecology of inshore dolphins *Tursiops truncatus* and *Sousa chinensis* in Moreton Bay, Australia. In S. Leatherwood & R. R. Reeves (Eds.), *The bottlenose dolphin* (pp. 285-293). Academic Press. <https://doi.org/10.1016/B978-0-12-440280-5.50018-4>
- Dares, L. E. (2019). *Habitat characteristics, density patterns and environmental niches of Indo-Pacific humpback dolphins (Sousa chinensis) of the Pearl River Estuary and Eastern Taiwan Strait* (PhD thesis). Trent University, Peterborough, Ontario, Canada.
- Dares, L. E., Hoffman, J. M., Yang, S. C., & Wang, J. Y. (2014). Habitat characteristics of the critically endangered Taiwanese humpback dolphins (*Sousa chinensis*) of the eastern Taiwan Strait. *Aquatic Mammals*, 40(4), 368-374. <https://doi.org/10.1578/AM.40.4.2014.368>
- de Freitas, M., Jensen, F. H., Tyne, J., Bejder, L., & Madsen, P. T. (2015). Echolocation parameters of Australian humpback dolphins (*Sousa sahulensis*) and Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) in the wild. *The Journal of the Acoustical Society of America*, 137(6), 3033-3041. <https://doi.org/10.1121/1.4921277>
- Dungan, S. Z. (2011). *Comparing the social structures of Indo-Pacific humpback dolphins (Sousa chinensis) from the Pearl River Estuary and eastern Taiwan Strait* (PhD thesis). Trent University, Peterborough, Ontario, Canada.
- Dungan, S. Z., Hung, S. K., Wang, J. Y., & White, B. N. (2012). Two social communities in the Pearl River Estuary population of Indo-Pacific humpback dolphins (*Sousa chinensis*). *Canadian Journal of Zoology*, 90(8), 1031-1043. <https://doi.org/10.1139/z2012-071>
- Dungan, S. Z., Wang, J. Y., Araújo, C. C., Yang, S. C., & White, B. N. (2016). Social structure in a critically endangered Indo-Pacific humpback dolphin (*Sousa chinensis*) population. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 26(3), 517-529. <https://doi.org/10.1002/aqc.2562>
- Durham, B. (1994). *The distribution and abundance of the humpback dolphin (Sousa chinensis) along the Natal coast, South Africa* (Master's thesis). University of Natal, Natal, South Africa.
- Findlay, K. P., Best, P. B., Ross, G. J. B., & Cockcroft, V. G. (1992). The distribution of small odontocete cetaceans off the coasts of South Africa and Namibia. *South African Journal of Marine Science*, 12(1), 237-270. <https://doi.org/10.2989/02577619209504706>
- Guissamulo, A., & Cockcroft, V. G. (2004). Ecology and population estimates of Indo-Pacific humpback dolphins (*Sousa chinensis*) in Maputo Bay, Mozambique. *Aquatic Mammals*, 30(1), 94-102. <https://doi.org/10.1578/AM.30.1.2004.94>
- Hanf, D. (2015). *Species distribution modelling of Western Pilbara inshore dolphins* (PhD thesis). Murdoch University, Perth, Western Australia, Australia.
- Hemami, M. R., Ahmadi, M., Sadegh-Saba, M., & Moosavi, S. M. H. (2018). Population estimate and distribution pattern of Indian Ocean humpback dolphin (*Sousa plumbea*) in an industrialised bay, northwestern Persian Gulf. *Ecological Indicators*, 89, 631-638. <https://doi.org/10.1016/j.ecolind.2018.02.031>
- Hoffman, J. M. (2015). *Regional differences in the whistles of Australasian humpback dolphins (genus Sousa)* (Master's thesis). Trent University, Peterborough, Ontario, Canada.
- Hoffman, J. M., Ponnampalam, L. S., Araújo, C. C., Wang, J. Y., Kuit, S. H., & Hung, S. K. (2015). Comparison of Indo-Pacific humpback dolphin (*Sousa chinensis*) whistles from two areas of western Peninsular Malaysia. *The Journal of the Acoustical Society of America*, 138(5), 2829-2835. <https://doi.org/10.1121/1.4934254>
- Hung, S. K. (2008). *Habitat use of Indo-Pacific humpback dolphins (Sousa chinensis)* (PhD thesis). University of Hong Kong, Hong Kong.

- Hunt, T. N., Allen, S. J., Bejder, L., & Parra, G. J. (2019). Assortative interactions revealed in a fission-fusion society of Australian humpback dolphins. *Behavioral Ecology*, 30(4), 914-927. <https://doi.org/10.1093/beheco/arz029>
- Hunt, T. N., Bejder, L., Allen, S. J., Rankin, R. W., Hanf, D., & Parra, G. J. (2017). Demographic characteristics of Australian humpback dolphins reveal important habitat toward the southwestern limit of their range. *Endangered Species Research*, 32, 71-88. <https://doi.org/10.3354/esr00784>
- Jaaman, S. A. (2006). *Marine mammal distribution and interactions with fisheries in East Malaysia* (PhD thesis). University of Aberdeen, Aberdeen, UK.
- Jaaman, S. A. B. H., Santos, M. D., Alava, M. N., & Suliansa, M. S. B. (1997). Preliminary investigation of marine mammal distribution, abundance, and interactions with humans in the southern Sulu Sea. *Asian Marine Biology*, 14, 61-81.
- James, B. S., Bester, M. N., Penry, G. S., Gennari, E., & Elwen, S. H. (2015). Abundance and degree of residency of humpback dolphins *Sousa plumbea* in Mossel Bay, South Africa. *African Journal of Marine Science*, 37(3), 383-394. <https://doi.org/10.2989/1814232X.2015.1083477>
- Jaroensutasinee, M., Jutapruet, S., & Jaroensutasinee, K. (2011). Population size of Indo-Pacific humpback dolphins (*Sousa chinensis*) at Khanom, Thailand. *Walailak Journal of Science and Technology (WJST)*, 7, 115-126.
- Jefferson, T. A. (2000). Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. *Wildlife Monographs*, 1-65.
- Jefferson, T. A., & Leatherwood, S. (1997). Distribution and abundance of Indo-Pacific hump-backed dolphins (*Sousa chinensis* Osbeck, 1765) in Hong Kong waters. *Asian Marine Biology*, 14, 110.
- Jia, X., Chen, T., Zhou, J., & Guo, Z. (2000). Preliminary investigation on the *Sousa chinensis* in the Pearl River Estuary. *Zhongguo Huanjing Kexue*, 20, 80-82.
- Jobson, A. J. (2006). *Insights into population size, group dynamics and site fidelity of humpback dolphins (Sousa chinensis) in Plettenberg Bay, South Africa* (Master's thesis). Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
- Jutapruet, S., Huang, S.-L., Li, S., Lin, M., Kittiwattana Wong, K., & Pradit, S. (2015). Population size and habitat characteristics of the Indo-Pacific humpback dolphin (*Sousa chinensis*) off Donsak, Surat Thani, Thailand. *Aquatic Mammals*, 41(2), 129-143. <https://doi.org/10.1578/AM.41.2.2015.129>
- Karczmarski, L. (1996). *Ecological studies of humpback dolphins Sousa chinensis in the Algoa Bay region, Eastern Cape, South Africa* (PhD thesis). University of Port Elizabeth, South Africa.
- Karczmarski, L. (1999). Group dynamics of humpback dolphins (*Sousa chinensis*) in the Algoa Bay region, South Africa. *Journal of Zoology*, 249(3), 283-293. <https://doi.org/10.1111/j.1469-7998.1999.tb00765.x>
- Karczmarski, L. (2000). Conservation and management of humpback dolphins: The South African perspective. *Oryx*, 34, 207-216. <https://doi.org/10.1046/j.1365-3008.2000.00120.x>
- Karczmarski, L., Cockcroft, V. G., & McLachlan, A. (1999). Group size and seasonal pattern of occurrence of humpback dolphins *Sousa chinensis* in Algoa Bay, South Africa. *South African Journal of Marine Science*, 21(1), 89-97. <https://doi.org/10.2989/025776199784126024>
- Keith, M., Peddemors, V. M., Bester, M. N., & Ferguson, J. W. H. (2002). Population characteristics of Indo-Pacific humpback dolphins at Richards Bay, South Africa: Implications for incidental capture in shark nets. *South African Journal of Wildlife Research*, 32(2), 153-162.
- Kiani, M. S. (2014). *Studies on marine cetaceans in coastal waters of Pakistan* (PhD thesis). University of Karachi, Pakistan.
- Kiani, M. S., & Van Waerebeek, K. (2015). A review of the status of the Indian Ocean humpback dolphin (*Sousa plumbea*) in Pakistan. *Advances in Marine Biology*, 72, 201-228. <https://doi.org/10.1016/bs.amb.2015.09.002>
- Koper, R. P., Karczmarski, L., du Preez, D., & Plön, S. (2016). Sixteen years later: Occurrence, group size, and habitat use of humpback dolphins (*Sousa plumbea*) in Algoa Bay, South Africa. *Marine Mammal Science*, 32(2), 490-507. <https://doi.org/10.1111/mms.12279>
- Leeney, R. H., Weir, C. R., Campredon, P., Regalla, A., & Foster, J. (2016). Occurrence of Atlantic humpback (*Sousa teuszii*) and bottlenose (*Tursiops truncatus*) dolphins in the coastal waters of Guinea-Bissau, with an updated cetacean species checklist. *Journal of the Marine Biological Association of the United Kingdom*, 96(4), 933-941. <https://doi.org/10.1017/S0025315415000661>
- Li, M., Wang, X., Hung, S. K., Xu, Y., & Chen, T. (2019). Indo-Pacific humpback dolphins (*Sousa chinensis*) in the Moyang River Estuary: The western part of the world's largest population of humpback dolphins. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 29(5), 798-808. <https://doi.org/10.1002/aqc.3055>
- Li, S., Lin, M., Xu, X., Xing, L., Zhang, P., Gozlan, R. E., Huang, S.-L., & Wang, D. (2016). First record of the Indo-Pacific humpback dolphins (*Sousa chinensis*) southwest of Hainan Island, China. *Marine Biodiversity Records*, 9(1), 3. <https://doi.org/10.1186/s41200-016-0005-x>
- Liu, M., Bejder, L., Lin, M., Zhang, P., Dong, L., & Li, S. (2020). Determining spatial use of the world's second largest humpback dolphin population: Implications for place-based conservation and management. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 30(2), 364-374. <https://doi.org/10.1002/aqc.3253>
- López, B. D., Grandcourt, E., Methion, S., Das, H., Bugla, I., Al Hameli, M., Al Ameri, H., Abdulla, M., Al Blooshi, A., & Al Dhaheri, S. (2018). The distribution, abundance and group dynamics of Indian Ocean humpback dolphins (*Sousa plumbea*) in the Emirate of Abu Dhabi (UAE). *Journal of the Marine Biological Association of the United Kingdom*, 98(5), 1119-1127. <https://doi.org/10.1017/S0025315417001205>
- Melly, B. L., McGregor, G., Hofmeyr, G. J. G., & Plön, S. (2018). Spatio-temporal distribution and habitat preferences of cetaceans in Algoa Bay, South Africa. *Journal of the Marine Biological Association of the United Kingdom*, 98(5), 1065-1079. <https://doi.org/10.1017/S0025315417000340>
- Minton, G., Poh, A. N. Z., Peter, C., Porter, L., & Krebs, D. (2016). Indo-Pacific humpback dolphins in Borneo: A review of current knowledge with emphasis on Sarawak. *Advances in Marine Biology*, 73, 141-156. <https://doi.org/10.1016/bs.amb.2015.07.003>
- Muralidharan, R. (2013). Sightings and behavioral observations of Indo-Pacific humpback dolphins *Sousa chinensis* (Osbeck, 1765) along Chennai coast, Bay of Bengal. *Journal of Threatened Taxa*, 5(15), 5002-5006. <https://doi.org/10.11609/JoTT.o3454.5002-6>
- Nithyanandan, M. (2010). Opportunistic sightings of Indo-Pacific humpback dolphin, *Sousa chinensis* from Kuwait waters with notes on their behaviour. *Journal of the Marine Biological Association of India*, 52, 19-23.
- Notarbartolo di Sciara, G., Kerem, D., Smeenk, C., Rudolph, P., Cesario, A., Costa, M., Elasar, M., Feingold, D., Fumagalli, M., Goffman, O., Hadar, N., Mebrathu, Y. T., & Scheinin, A. (2017). *Cetaceans of the Red Sea* (CMS Technical Series Publication 33). Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals. 86 pp.
- Or, K. M. (2017). *Socio-spatial ecology of Indo-Pacific humpback dolphins (Sousa chinensis) in Hong Kong and the Pearl River Estuary* (PhD thesis). University of Hong Kong, Hong Kong.
- Panicker, D., Haris, A., & Sutaria, D. (2019). Indian Ocean humpback dolphin (*Sousa plumbea*) estuary-use patterns in Kochi harbor, India. *Marine Mammal Science*, 34, 208-219. <https://doi.org/10.1111/mms.12438>
- Parra, G. J. (2005). *Behavioural ecology of Irrawaddy, Orcaella brevirostris (Owen in Gray, 1866), and Indo-Pacific humpback dolphins, Sousa chinensis (Osbeck, 1765), in northeast Queensland, Australia: A comparative study* (PhD thesis). James Cook University, Queensland, Australia.
- Parra, G. J., Corkeron, P. J., & Arnold, P. (2011). Grouping and fission-fusion dynamics in Australian snubfin and Indo-Pacific humpback dolphins. *Animal Behaviour*, 82(6), 1423-1433. <https://doi.org/10.1016/j.anbehav.2011.09.027>
- Parsons, E. C. M. (1998). Observations of Indo-Pacific hump-backed dolphins in Goa, India. *Marine Mammal Science*, 14, 166-170. <https://doi.org/10.1111/j.1748-7692.1998.tb00702.x>
- Parsons, E. C. M. (2004). The behavior and ecology of the Indo-Pacific humpback dolphin (*Sousa chinensis*). *Aquatic Mammals*, 30(1), 38-55. <https://doi.org/10.1578/AM.30.1.2004.38>
- Peng, C., Wu, H., Wang, X., Zhu, Q., Jefferson, T. A., Wang, C. C., Xu, Y., Li, J., Huang, H., Chen, M., & Huang, S.-L. (2019, in press). Abundance and residency dynamics of the Indo-Pacific humpback dolphin, *Sousa chinensis*, in the Dafengjiang River Estuary, China. *Marine Mammal Science*. <https://doi.org/10.1111/mms.12663>
- Pogson-Manning, L. M. (2015). *Social systems and core areas of use of Australian humpback dolphins (Sousa sahalensis) within Moreton Bay, Australia* (Master's thesis). Southern Cross University, East Lismore, NSW, Australia.
- Poh, A. N. Z., Peter, C., Ngeian, J., Tuen, A. A., & Minton, G. (2016). Abundance estimates of Indo-Pacific humpback dolphins (*Sousa chinensis*) in Kuching Bay, East Malaysia. *Aquatic Mammals*, 42(4), 462-465. <https://doi.org/10.1578/AM.42.4.2016.462>
- Qiu, Y. S., & Chen, T. (2004). The Indo-Pacific humpback dolphins (*Sousa chinensis*) survey in the Pearl River Estuary. In G. M. He (Ed.), *Proceedings of hydrobiological*

- and ecological studies in the Pearl River Estuary (pp. 188-198). Science Press. (In Chinese)
- Roos, M. M. H. (2006). *The habitat use and ranging patterns of the Indo-Pacific humpback dolphin, Sousa chinensis, in the Great Sandy Strait, Australia* (Master's thesis). Van Hall Institute.
- Saayman, G. S., & Tayler, C. K. (1973). Social organization of inshore dolphins (*Tursiops aduncus* and *Sousa*) in the Indian Ocean. *Journal of Mammalogy*, *54*, 993-996. <https://doi.org/10.2307/1379100>
- Saayman, G. S., & Tayler, C. K. (1979). The socioecology of humpback dolphins (*Sousa* sp.). In H. E. Winn & B. L. Olla (Eds.), *The behaviour of marine animals. Vol. 3: Cetaceans* (pp. 165-226). Plenum Press. [https://doi.org/10.1007/978-1-4684-2985-5\\_6](https://doi.org/10.1007/978-1-4684-2985-5_6)
- Sharpe, M., & Berggren, P. (2019). Indian Ocean humpback dolphin in the Menai Bay off the south coast of Zanzibar, East Africa is Critically Endangered. *Aquatic Conservation: Marine and Freshwater Ecosystems*, *29*(12), 2133-2146. <https://doi.org/10.1002/aqc.3221>
- Smith, B. D., Ahmed, B., Mowgli, R. M., & Strindberg, S. (2008). Species occurrence and distributional ecology of nearshore cetaceans in the Bay of Bengal, Bangladesh, with abundance estimates for Irrawaddy dolphins *Orcaella brevirostris* and finless porpoises *Neophocaena phocaenoides*. *Journal of Cetacean Resource Management*, *10*(1), 45-58.
- Spaans, B. (1990). Dolphins in the coastal area of Guinea-Bissau. *Lutra*, *33*, 126-131.
- Sutaria, D., & Jefferson, T. A. (2004). Records of Indo-Pacific humpback dolphins (*Sousa chinensis*, Osbeck, 1765) along the coasts of India and Sri Lanka: An overview. *Aquatic Mammals*, *30*(1), 125-136. <https://doi.org/10.1578/AM.30.1.2004.125>
- Van Parijs, S. M., & Corkeron, P. J. (2001). Vocalizations and behaviour of Pacific humpback dolphins *Sousa chinensis*. *Ethology*, *107*, 701-716. <https://doi.org/10.1046/j.1439-0310.2001.00714.x>
- Van Parijs, S. M., Smith, J., & Corkeron, P. J. (2002). Using calls to estimate the abundance of inshore dolphins: A case study with Pacific humpback dolphins *Sousa chinensis*. *Journal of Applied Ecology*, *39*(5), 853-864. <https://doi.org/10.1046/j.1365-2664.2002.00756.x>
- Van Waerebeek, K., Barnett, L., Camara, A., Cham, A., Diallo, M., Djiba, A., Jallow, A. O., Ndiaye, E., Samba, A. O., Bilal, O., & Bamy, I. L. (2004). Distribution, status, and biology of the Atlantic humpback dolphin, *Sousa teuszii* (Kükenthal, 1892). *Aquatic Mammals*, *30*(1), 56-83. <https://doi.org/10.1578/AM.30.1.2004.56>
- Wang, J. Y., Yang, S. C., Fruet, P. F., Daura-Jorge, F. G., & Secchi, E. R. (2012). Mark-recapture analysis of the critically endangered eastern Taiwan Strait population of Indo-Pacific humpback dolphins (*Sousa chinensis*): Implications for conservation. *Bulletin of Marine Science*, *88*(4), 885-902.
- Wang, Q. (2006). *Studies on population abundance, distribution and conservation strategies of Indo-Pacific humpback dolphin (Sousa chinensis) in Beihai waters* (Master's thesis). Anhui Normal University, Hefei, China. (In Chinese with English Abstract)
- Wang, X., Wu, F., Turvey, S. T., Rosso, M., & Zhu, Q. (2016). Seasonal group characteristics and occurrence patterns of Indo-Pacific humpback dolphins (*Sousa chinensis*) in Xiamen Bay, Fujian Province, China. *Journal of Mammalogy*, *97*(4), 1026-1032. <https://doi.org/10.1093/jmammal/gyv002>
- Wang, X., Wu, F., Turvey, S. T., Rosso, M., Tao, C., Ding, X., & Zhu, Q. (2015). Social organization and distribution patterns inform conservation management of a threatened Indo-Pacific humpback dolphin population. *Journal of Mammalogy*, *96*(5), 964-971. <https://doi.org/10.1093/jmammal/gyv097>
- Wang, Z., Fang, L., Shi, W., Wang, K., & Wang, D. (2013). Whistle characteristics of free-ranging Indo-Pacific humpback dolphins (*Sousa chinensis*) in Sanniang Bay, China. *The Journal of the Acoustical Society of America*, *133*(4), 2479-2489. <https://doi.org/10.1121/1.4794390>
- Weir, C. R. (2009). Distribution, behaviour and photo-identification of Atlantic humpback dolphins *Sousa teuszii* off Flamingos, Angola. *African Journal of Marine Science*, *31*, 319-331. <https://doi.org/10.2989/AJMS.2009.31.3.5.993>
- Weir, C. R. (2015). Photo-identification and habitat use of Atlantic humpback dolphins *Sousa teuszii* around the Río Nuñez Estuary in Guinea, West Africa. *African Journal of Marine Science*, *37*, 325-334. <https://doi.org/10.2989/1814232X.2015.1069757>
- Weir, C. R., & Collins, T. (2015). A review of the geographical distribution and habitat of the Atlantic humpback dolphin (*Sousa teuszii*). *Advances in Marine Biology*, *72*, 79-117. <https://doi.org/10.1016/bs.amb.2015.08.001>
- Wolff, W. J. (1998). *The end of the east-Atlantic flyway: Waders in Guinea-Bissau* (Report on a cooperative research project in the estuaries of Guinea-Bissau, October 1992-May 1993; WIWO Report No. 39). Foundation Working Group for International Waterbird and Wetland Research. 94 pp.
- Wong, W. (2017). *Macro-and micro-scale anthropogenic impacts on Chinese white dolphins in Hong Kong: Quantifying impacts of habitat loss and coastal tourism* (PhD thesis). University of Hong Kong, Hong Kong.
- Wright, K. A. (2014). *Scarring, sex assignment, and sex-specific sociality of Indo-Pacific humpback dolphins (Sousa chinensis) in the Pearl River Estuary and eastern Taiwan Strait*. Trent University, Peterborough, Ontario, Canada.
- Wu, F., Wang, X., Ding, X., Miao, X., & Zhu, Q. (2014). Distribution pattern of Indo-Pacific humpback dolphins (*Sousa chinensis*) along coastal waters of Fujian Province, China. *Aquatic Mammals*, *40*(4), 341-349. <https://doi.org/10.1578/AM.40.4.2014.341>
- Wu, F., Wang, X., Ding, X., Dai, Y., Zhao, L., & Zhu, Q. (2019). Occurrences of Xiamen Indo-Pacific humpback dolphins (*Sousa chinensis* Osbeck, 1765), in waters of Weitou Bay, China. *Acta Theriologica Sinica*, *39*(6), 608-613.
- Würsig, B., Parsons, E., Piwetz, S., & Porter, L. (2016). The behavioural ecology of Indo-Pacific humpback dolphins in Hong Kong. *Advances in Marine Biology*, *73*, 65-90. <https://doi.org/10.1016/bs.amb.2015.08.008>
- Xu, X., Song, J., Zhang, Z., Li, P., Yang, G., & Zhou, K. (2015). The world's second largest population of humpback dolphins in the waters of Zhanjiang deserves the highest conservation priority. *Scientific Reports*, *5*, 8147. <https://doi.org/10.1038/srep08147>
- Xu, X., Zhang, Z., Ma, L., Li, P., Yang, G., & Zhou, K. (2012). Site fidelity and association patterns of Indo-Pacific humpback dolphins off the east coast of Zhanjiang, China. *Acta Theriologica*, *57*(2), 99-109. <https://doi.org/10.1007/s13364-011-0058-5>
- Yan, S. (2016). *Abundance and distribution pattern of Chinese white dolphin (Sousa chinensis Osbeck, 1765) in Sanniang Bay, Guangxi Province* (Master's thesis). Shandong University, Weihai. (In Chinese with English abstract)
- Zhou, K., Xu, X., & Tian, C. (2007). Distribution and abundance of Indo-Pacific humpback dolphins in Leizhou Bay, China. *New Zealand Journal of Zoology*, *34*(1), 35-42. <https://doi.org/10.1080/03014220709510061>