Short Communication

A first record of goblinfish *Trichosomus trachinoides* (Actinopterygii: Perciformes: Synanceiidae) from Cambodian coastal waters

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Tetrarogid fishes are sometimes placed in the Scorpaenidae (Poss, 1999; Randall & Lim, 2000), Synanceiidae (Selvakumar *et al*., 2022) or Tetrarogidae families within the Scorpaeniformes or Perciformes (Motomura *et al*., 2008; Ng *et al*., 2015; Nelson *et al*., 2016; Chungthanawong & Motomura, 2018; Moazzam & Osmany, 2023; Su & Chen, 2023). Most recently, they were placed in the Tetraroginae subfamily of the Synanceiidae (Fricke *et al*., 2024). Members of this subfamily are commonly known as waspfishes and include 44 valid species in 17 genera (Chungthanawong & Motomura, 2021; Fricke *et al*., 2024). These occur in marine and brackish waters throughout the Indo-West Pacific region (Murugan *et al*., 2023; Fricke *et al*., 2024; Froese & Pauly, 2024). Waspfishes are nocturnal, bottom-dwelling and free-swimming and can inhabit waters up to depths of 300 m in tropical seas (Selvakumar *et al*., 2022). They are easily recognised by their compressed body with spiny head, dorsal and anal fins, a round caudal fin, movable lacrimal bone, skin at gill opening broadly connected to isthmus, and lower pectoral-fin rays not separated from other pectoral-fin rays (Yoshida *et al*., 2013; Kimura *et al*., 2015, 2018; Chungthanawong & Motomura, 2021; Su & Chen, 2023).

In recent taxonomic reviews, *Trichosomus trachinoides* (Cuvier 1829) has been placed in a monotypic genus (Chungthanawong & Motomura, 2021; Fricke *et al*., 2024) and is commonly known as the goblinfish or mangrove waspfish (Yoshida *et al*., 2013; Kimura *et al*., 2015, 2018; Kwik & Lim, 2020). This genus is characterized by a body covered or not covered with small scales, pelvic fin with one spine and four to five fin rays, three anteriormost dorsal-fin spines forming a separate fin, cirri or papillae on the head and dorsal surface of body, lateral line running along the dorsal-fin base and origin of the first dorsal-fin spine extending well behind the posterior margin of orbit (Chungthanawong & Motomura, 2021). The species was previously placed in the *Apistus* and *Vespicula* genera (Randall & Lim, 2000; Prokofiev, 2008; Kwik & Lim, 2020; Chungthanawong & Motomura, 2021; Fricke *et al*., 2024) and two formerly recognised taxa (*V. bottae* & *V. gogorzae*) are now regarded as junior synonyms of *T. trachinoides* (Chungthanawong & Motomura, 2021; Fricke *et al*., 2024).

During field sampling for fish larvae and juveniles in June 2023, we collected seven waspfishes on the coast of Koh Kong Province in southwest Cambodia. Following examination of identification keys (Poss, 1999; Yoshida *et al*., 2013; Kimura *et al*., 2015, 2018) and other literature (Chungthanawong & Motomura, 2021), the seven speci-

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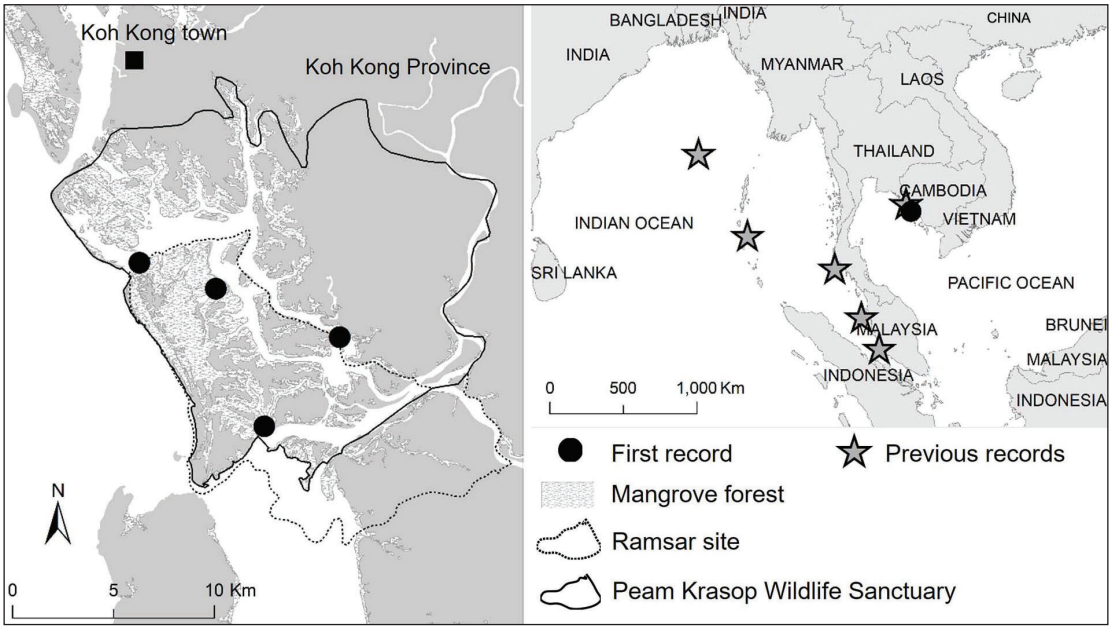


Fig. 1 Records for goblinfish *Trichosomus trachinoides*. Solid circles represent the first records from Cambodia, recorded in mangrove habitat in Peam Krasop Wildlife Sanctuary (dark outline). Asterisks are records reported by Froese & Pauly (2024)

mens were identified as *T. trachinoides*. These are reported herein as the first records for the species in Cambodia.

Trichosomus trachinoides (Cuvier 1829)

Material examined: Seven specimens were collected in mangrove forest creeks in Peam Krasop Wildlife Sanctuary, Koh Kong Province (Fig. 1). The seven specimens were fixed with 5% formalin and rinsed with water before being transferred to 70% ethanol. These were deposited in the fish collection room of the Faculty of Fisheries and Aquaculture, Royal University of Agriculture (RUAFI) in Cambodia and were registered as follows: RUAFI-M00052 (34.69 mm SL [standard length]) & RUAFI-M00053 (33.49 mm SL), collected 4 June 2023, 11.509400°N, 103.023730°E; RUAFI-M00054 (17.02 mm SL), collected 3 June 2023, 11.520948°N, 102.989651°E; RUAFI-M00055 (24.58 mm SL), RUAFI-M00056 (24.96 mm SL) & RUAFI-M00057 (20.31 mm SL), collected 7 June 2023, 11.487840°N, 103.078930°E; RUAFI-M00058 (46.64 mm SL), collected 5 June 2023, 11.44834°N, 103.04243°E.

Morphological terminology follows Chungthanawong & Motomura (2021). Measurements were taken with a digital calliper to the nearest 0.01 mm. Measurements and counts generally follow Chungthanawong & Motomura (2021). Most morphometric data are given as a percentage of standard length, whereas snout length, orbit diameter, interorbital width, upper-jaw length and postorbital length are given as a percentage of head length.

Diagnosis: *Trichosomus trachinoides* is characterised by an oblong and compressed body, spiny head, 14 dorsal-fin spines, five dorsal-fin soft rays, three anal-fin spines, four branched anal-fin soft rays (Table 1), a round or truncate caudal fin (with non-branched and branched rays), presence of palatine teeth (with spine), two spiny lacrimal bones and three anterior spines forming a nearly separate fin. The dorsal fin originates well behind the eye (Fig. 2) which is small, with the orbit diameter 4.72–9.80% of SL (Table 1). The bodies of our preserved specimens are mottled with black blotches, whereas the caudal fins are translucent with an indistinct vertical dark band, and the soft-rayed portions of the dorsal and anal fins have a broad black band (Fig. 2).

Description: Morphometric and meristic data are shown in Table 1. Additional characteristics of specimens include: spiny head oblique and straight, with two spinous lacrimal bone. Cirri, papillae, or tentacles on head, body and eyes. Pectoral fin with 13 fin rays. Pelvic fin with one spine and four branched rays. Gill cover spine with four spines. Dorsal fin with anterior three spines forming a nearly separate fin. Caudal fin rounded.

Distribution: *Trichosomus trachinoides* was previously reported from the eastern India and western Pacific Oceans including Myanmar, China, Malaysia, Indo-

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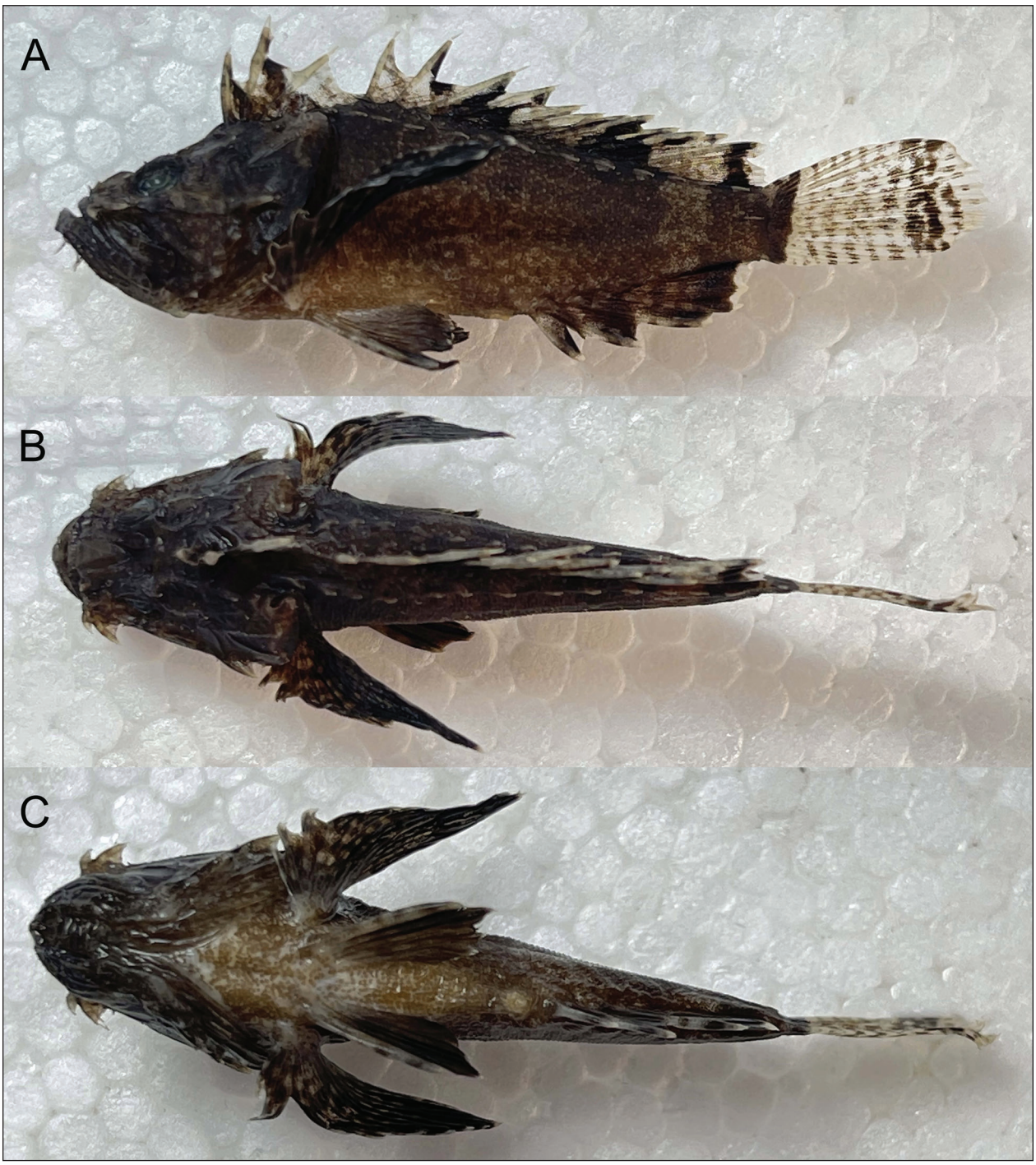


Fig. 2 Lateral (A), dorsal (B) and C) ventral views of preserved specimen of *Trichosomus trachinoides* (RUAFI-M00053) collected in Koh Kong Province, southwest Cambodia

nesia, Philippines, Singapore, Vietnam and Thailand (Prokofiev, 2008; Kottelat, 2013; Yoshida *et al*., 2013; Kimura *et al*., 2015, 2018; Kwik & Lim, 2020; Chungthanawong & Motomura, 2021; Fricke *et al*., 2024). Our records from Peam Krasop Wildlife Sanctuary represent the first for Cambodia as the species was not previously documented in Cambodian waters or included in field guides for the country (Rainboth, 1996; Ing *et al*., 2006; Rainboth

Table 1 Morphometric and meristic data for seven specimens of *Trichosomus trachinoides* from Cambodia

Morphometric Characters	Mean±SD	Min–Max
Total length (TL; mm)	34.36 ± 8.31	23.03–25.10
Standard length (SL; mm)	28.81 ± 10.15	17.02–46.64
As % of SL		
Head length	41.79 ± 3.63	34.56–45.77
Head width	28.71 ± 1.92	25.15–30.77
Head depth	26.00 ± 2.81	19.79–28.11
Snout length	12.52 ± 1.40	10.60–14.98
Body depth	26.47 ± 2.78	22.56–31.07
Body width	15.94 ± 1.78	13.64–17.62
Orbit diameter	7.38 ± 1.87	4.72–9.80
Interorbital width	9.09 ± 1.40	6.56–10.54
Upper-jaw length	22.08 ± 5.56	11.69–26.61
Postorbital length	20.06 ± 2.28	16.49-21.85
Pre-dorsal-fin length	26.87 ± 2.92	21.48–29.89
Pre-anal-fin length	64.40 ± 5.69	51.72–67.62
Pre-pelvic-fin length	40.31 ± 12.26	29.91–67.41
Pre-pectoral-fin length	33.94 ± 4.00	26.84–39.64
Caudal-peduncle depth	10.71 ± 0.96	9.11–12.06
Caudal-peduncle length	5.97 ± 2.10	3.17–8.52
Dorsal-fin base length	74.72 ± 7.74	58.36–79.90
Anal-fin base length	29.29 ± 2.82	23.58–31.51
Pelvic-fin base length	16.48 ± 1.90	13.25–18.19
Pectoral-fin base length	18.81 ± 11.17	10.91–43.75
Caudal-fin length	30.87 ± 3.39	23.86–33.37
Pectoral-fin length	37.58 ± 10.04	16.47–45.36
1st dorsal-fin spine length	15.07 ± 3.55	10.44–18.47
2nd dorsal-fin spine length	18.48 ± 3.53	12.16–22.09
3rd dorsal-fin spine length	17.57 ± 2.67	13.83–21.71
4th dorsal-fin spine length	14.81 ± 3.00	10.29–18.76
5th dorsal-fin spine length	17.43 ± 2.97	12.54–20.80
6th dorsal-fin spine length	19.48 ± 2.99	14.75–22.38
Last dorsal-fin spine length	21.16 ± 3.25	15.67–24.37
Longest dorsal-fin soft ray length	18.52 ± 3.60	11.96–21.96
1st anal-fin spine length	12.08 ± 1.86	9.51–14.54
2nd anal-fin spine length	17.05 ± 2.94	12.39–21.12
3rd anal-fin spine length	20.86 ± 2.88	16.70–25.26
Longest anal-fin soft ray length	20.09 ± 3.37	14.84–25.09
Pelvic-fin spine length	21.48 ± 3.42	15.27–26.32
Longest pelvic-fin soft ray length	23.97 ± 2.71	18.40–27.14
As % of head length		
Snout length	30.08 ± 3.41	25.82–35.05
Orbit diameter	17.48 ± 3.31	12.80–22.16
Interorbital width	21.70 ± 2.50	18.98–25.74
Upper-jaw length	52.36 ± 11.11	33.81–63.95
Postorbital length	48.04 ± 4.14	40.16–63.95
Meristic counts	**Mode**	
Dorsal-fin rays	XV,4	XV,4
Anal-fin rays	III,4	III,4
Pectoral-fin rays	13	13
Pelvic-fin rays	I,4	I,4
Caudal-fin rays	18	18
Lateral-line pores	14	12–15

et al., 2012; So *et al*., 2018; Taki *et al*., 2021; Froese & Pauly, 2024).

Habitat & Other Fauna: Our specimens were captured in a seine net (1 mm mesh size, 5 m length and 2 m depth) in mangrove forest creeks in Peam Krasop Wildlife Sanctuary (Fig. 3). This is consistent with previous records from mangroves in Singapore (Kwik & Lim, 2020) and Peninsular Malaysia (Zainal Abidin *et al*., 2021). More specifically, our specimens were found in sandy, muddy and debris habitats with water depths ranging from 0.45 to 1.10 m (mean ± SD: 0.68 ± 0.29), levels of dissolved oxygen from 6.64 to 6.96 mg/l (6.81 ± 0.13), pH from 7.61 to 8.31 (7.97 ± 0.31), temperatures from 28.8 to 29.3 °C (29.03 ± 0.26), salinity from 5 to 18 ppt (11.25 ± 5.85) and water clarity from 21 to 105 cm (56.63 ± 42.20). Similar to our records, the species has been reported from waters with sandy, broken-shell bottoms (Matsunuma *et al*., 2011; Yoshida *et al*., 2013; Kimura *et al*., 2015, 2018).

Alongside invertebrates such as snails (*Assiminea* sp. [Assimineidae], *Nassarius* sp. [Nassariidae], *Natica* sp. [Naticidae]), shrimps (*Acetes* sp. [Sergestidae]; *Penaeus* sp., *Metapenaeus lysianassa* & *Metapenaeus* sp. [Penaeidae]), crabs (*Portunus* sp. [Portunidae]) and bivalves (*Modiolus* sp. [Modiolidae]), other fish species

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captured with *T. trachinoides* included Asiatic glassfishes (*Ambassis interrupta* & *A. vachellii* [Ambassidae]), butid sleepers (*Butis butis* & *Butis* spp. [Butidae]), puffers (*Chelonodon* sp. & *Lagocephalus* spp. [Tetraodontidae]), tonguefishes (*Cynoglossus puncticeps* [Cynoglossidae]), gobies (*Drombus globiceps*, *Glossogobius* spp., *Mugilogobius* spp. & *Pseudogobius javanicus* [Gobiidae]), threadfin (*Eleutheronema tetradacrylum* [Polynemidae]), mojarras (*Gerres* spp. [Gerreidae]), pipefishes (*Hippichthys penicillus* [Syngnathidae]), Old World silverside (*Hypoatherina* spp. [Atherinidae]), ponyfishes (*Nuchequula* spp. & *Leiognathus equula* [Leiognathidae]), snappers (*Lutjanus russellii* [Lutjanidae]), moonfishes (*Monodactylus argenteus* [Monodactylidae]), priapiumfishes (*Neostethus lankesteri* [Phallostethidae]), grunts (*Pomadasys kaakan* & *Pomadasys* spp. [Haemulidae]), dragonets (*Repomucenus sagitta* [Callionymidae]), rabbitfishes (*Siganus guttatus* & *S. javus* [Siganidae]), sillagos (*Sillago sihama* [Sillaginidae]), anchovies (*Thryssa hamiltoni* [Engraulidae]) and viviparous halfbeaks (*Zenarchopterus* spp. [Zenarchopteridae]).

Remarks: The characteristics of our specimens match those given for *Trichosomus* by Chungthanawong & Motomura (2021), including three anterior-most dorsal-fin spines forming a separate fin, cirri or papillae on head and body, origin of first dorsal-fin spine extending well behind the posterior margin of orbit, 15 dorsal-fin spines, four pelvic-fin soft rays, 13 pectoral-fin rays and 12–15 lateral-line pores. The genus is easily distinguished from all other tetrarogid genera by the anterior dorsal fin having three spines which form a separate fin, except for the genera *Neovespicula* and *Pseudovespicula* (Chungthanawong & Motomura, 2021). Our specimens also agree closely with diagnostic characteristics of *T. trachinoides* specimens from Vietnam, Thailand, Malaysia, Myanmar, Philippines and China (Poss, 1999; Prokofiev, 2008; Yoshida *et al*., 2013; Kimura *et al*., 2015, 2018; Froese & Pauly, 2024), apart from the number of dorsal-fin spine and soft rays (respectively 15 & four in our specimens vs. 14 & five). However, the latter characteristics of our specimens match those provided by Chungthanawong & Motomura (2021) for the species (15 & four, respectively).

Trichosomus trachinoides resembles *Neovespicula depressifrons*, *Pseudovespicula cypho*, *P. zollingeri* and *P. dracaena* in that the first three dorsal-fin spines form a separate fin, but differs from *N. depressifrons* in the number of dorsal and pectoral fin soft rays (four & 13 vs 6–7 & 11 in *N. depressifrons*) and the diameter of the orbit (12.80–22.16 vs. 9–10 % SL in *N. depressifrons* (Poss, 1999). It can be distinguished from *P. cypho* by the number of dorsal fin spines and soft rays (15 & four vs. 13 & seven in *P. cypho*) and body depth (22.56–31.07 vs. 37 % SL in *P. cypho*) and



Fig. 3 Mangroves in Peam Krasop Wildlife Sanctuary, Koh Kong Province, southwest Cambodia

differs from *P. zollingeri* by the number of dorsal soft rays (five vs. six in *P. zollingeri*) and body depth (22.56–31.07 vs. 31–37 % SL in *P. zollingeri)*. Finally, it differs from *P. dracaena* by the dorsal spine, soft ray and anal soft ray counts (15, four & four vs. 12, 7 & 5–6 in *P. dracaena*) (Froese & Pauly, 2024).

Only three species in the Synanceiidae (*Inimicus didactylus*, *Minous monodactylus* & *Synanceia horrida*) and five in the Scorpaenidae (*Pterois volitans*, *Scorpaenopsis diabolus*, *S. macrochir*, *S. neglecta* & *S. venosa*) are previously known from coastal waters in Cambodia (Ing *et al*., 2006; Froese & Pauly 2024). In extending the confirmed range of *T. trachinoides* into Cambodian coastal waters, our specimens can therefore be included in FishBase (<www.fishbase.se>) and future field guides related to coastal and marine fishes in Cambodia. Future studies should consider collecting additional voucher specimens and fin clips or tissue samples to generate reference data for molecular analysis of the evolutionary history of the species in Cambodia.

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References

Chungthanawong, S. & Motomura H. (2018) Two new species of the waspfish genus *Ablabys* (Scorpaeniformes: Tetrarogidae) from the western Pacific Ocean. *Ichthyological Research*, **66**, 114–128.

Chungthanawong, S. & Motomura H. (2021) Review of the waspfish genus *Neocentropogon* (Tetrarogidae), with a key to genera in the family. *Ichthyological Research*, **68**, 404–425.

Fricke, R., Eschmeyer, W.N. & Fong J.D. (2024) *Eschmeyer's Catalog of Fishes: Genera/Species by Family/Subfamily*. Http://researcharchive.calacademy.org/research/ichthyology/catalog/SpeciesByFamily.asp [accessed 20 March 2024].

Froese, R. & Pauly, D. (2024) *FishBase*. Https://www.fishbase.us/ [accessed 25 March 2024].

Ing T., Jensen, K.R. & Va L. (2006) *A Field Guide to the Marine Living Resources in Cambodia*. Fisheries Administration, Ministry of Agriculture, Forestry and Fisheries, Phnom Penh, Cambodia.

Kimura S., Arshad, A., Imamura H. & Ghaffar, M.A. (2015) *Fishes of the Northwestern Johor Strait, Peninsular Malaysia*. Universiti Putra Malaysia Press, Serdang, Malaysia and Mie University, Tsu, Japan.

Kimura S., Imamura H., Nguyen V.Q. & Pham T.D. (2018) *Fishes of Ha Long Bay, the World Natural Heritage Site in Northern Vietnam*. Fisheries Research Laboratory, Mie University, Tsu, Japan.

Kottelat, M. (2013) The fishes of the inland waters of Southeast Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries. *Raffles Bulletin of Zoology*, **27**, 1–663.

Kwik, J.T.B. & Lim, K.K.P. (2020) Scorpionfishes (Teleostei: Scorpaenoidei) of Singapore. *Nature in Singapore*, **13**, 11–26.

Matsunuma M., Motomura H., Matsuura K., Shazili, N.A.M. & Ambak, M.A. (2011) *Fishes of Terengganu – East Coast of Malay Peninsula, Malaysia*. National Museum of Nature and Science, Universiti Malaysia Terengganu, Malaysia and Kagoshima University Museum, Japan.

Moazzam, M. & Osmany, H.B. (2023) Scorpionfishes of families Scorpianenidae, Tetrarogidae and Apistidae, from Pakistan. *International Journal of Biology and Biotechnology*, **20**, 293–315.

Motomura H., Last, P.R. & Johnson, J.W. (2008) Review of the waspfish genus *Liocranium* (Scorpaeniformes: Tetrarogidae), with restoration of *L. pleurostigma* (Weber). *Zootaxa*, **1820**, 27–40.

Murugan, A., Mahadevan, G., Subburaman, S., Ragul, S. & Fricke, R. (2023) First record of the spiny waspfish, *Ablabys macracanthus* (Bleeker, 1852; Scorpaeniformes: Synanceiidae) from Indian Coastal Waters. *Thalassas: An International Journal of Marine Sciences*, **39**, 1033–1038.

Nelson, J.S., Grande, T.C. & Wilson, M.V.H. (2016) *Fishes of the World*. John Wiley & Sons, New Jersey, USA.

Ng H.H., Tan H.H., Lim K.K.P., Ludt, W.B. & Chakrabarty, P. (2015) Fishes of the Eastern Johor Strait. *Raffles Bulletin of Zoology*, **31**, 303–337.

Poss, S.G. (1999) Scorpaenidae. Scorpionfishes (also, lionfishes, rockfishes, stingfishes, stonefishes, and waspfishes). In *FAO Species Identification Guide for Fishery Purposes. The Living Marine Resources of the Western Central Pacific. Vol. 4. Bony Fishes, part 2 (Mugilidae to Carangidae)* (eds K.E. Carpenter & V.H. Niem), pp. 2291–2352. FAO, Rome, Italy.

Prokofiev, A.M. (2008) Scorpionfishes of families Apistidae, Tetrarogidae, and Aploactinidae of Nha Trang Bay (South China Sea, Central Vietnam). *Journal of Ichthyology*, **48**, 301–312.

Rainboth, W.J. (1996) *FAO Species Identification Field Guide for Fishery Purposes: Fishes of the Cambodian Mekong*. Food and Agriculture Organization of the United Nations, Rome, Italy.

Rainboth, W.J., Vidthayanon, C. & Yen M.D. (2012) *Fishes of the Greater Mekong Ecosystem with Species List and Photographic Atlas*. Museum of Zoology, University of Michigan, USA.

Randall, J.E. & Lim, K.K.P. (2000) A checklist of the fishes of the South China Sea. *The Raffles Bulletin of Zoology*, **8**, 569–667.

Selvakumar, V., Subburaman, S., Nagarajan, D., Nagarajan, J. & Murugan, A. (2022) Range extension of the redskin waspfish, *Ablabys binotatus* (Peters, 1855) (Scorpaeniformes : Synanceiidae) from coromandel waters, east coast of India. *Indian Journal of Natural Sciences*, **13**, 50847–50851.

So N., Utsugi K., Shibukawa K., Thach P., Chhuoy S., Kim S., Chin D., Nen P. & Chheng P. (2018) *Fishes of Cambodian Freshwater Bodies*. Inland Fisheries Research and Development Institute, Fisheries Administration, Phnom Penh, Cambodia.

Su Y. & Chen Y.C. (2023) A new record of the whiteface waspfish *Richardsonichthys leucogaster* (Richardson, 1848) in Taiwanese waters (Actinopterygii: Scorpaeniformes: Tetrarogidae). *Platax*, **2023**, 43–53.

Taki Y., Ohtsuka R., Komoda M., Natori Y., Utsugi K., Shibukawa K., Oizumi T., Ottomanski, S., Praxaysombath, B., Phongsa K., Magtoon, W., Musikasinthorn, P., Grudpan, C., Grudpan, J., Suvarnaraksha, A., So N., Thach P., Nguyen P.T., Tran D.D. & Tran L.X. (2021) *Fishes of the Indochinese Mekong*. Nagao Natural Environment Foundation, Tokyo, Japan.

Yoshida T., Motomura H., Musikasinthorn, P. & Matsuura K. (2013) *Fishes of Northern Gulf of Thailand*. National Museum of Nature and Science, Tsukuba, Research Institute for Humanity and Nature, Kyoto, and Kagoshima University Museum, Kagoshima, Japan.

Zainal Abidin, D.H., Lavoué, S., Hassan Alshari, N.F.M.A., Nor, S.A.M., Rahim, M.A. & Mohammed Akib, N.A. (2021) Ichthyofauna of Sungai Merbok mangrove forest reserve, northwest peninsular Malaysia, and its adjacent marine waters. *Check List*, **17**, 601–631.

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