

TWO NEW RECORDS OF BENTHO-NERITIC OCTOPODS (CEPHALOPODA, OCTOPODIDAE) FROM THAI WATERS

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ABSTRACT: Two incirrate octopods, *Abdopus aculeatus* (d'Orbigny, 1834) and *Callisoctopus nocturnus* (Norman & Sweeney, 1997) are first recorded from Thai waters. Occurrence of the former species in the Indian Ocean, the Andaman Sea, was confirmed. The western distribution range in the South China Sea of the latter species extended into the Gulf of Thailand. The new records bring the number of benthic-oceanic octopod taxa in Thai waters to twenty-five.

Key words: new record, benthic-oceanic octopods, Thai waters

INTRODUCTION

Benthic-oceanic octopods are members of the family Octopodidae with around 300 valid species. (Norman *et al.* 2016a). Their common characters are eight arms, muscular mantle and arms and absence of fins. Twenty-eight species have been recorded in South China Sea (Norman *et al.* 2016b). Nabhitabhata and Nateewathana (2016) listed 37 species of octopods from the Thai-Malay Peninsular waters, including the Western Gulf of Thailand, the Malacca Straits and the Eastern Andaman Sea. From Thai waters, twenty-four species of benthic-oceanic octopus had been reported. Five species are recorded only from the Gulf of Thailand, four species from the Andaman Sea and fifteen species from both waters (Nabhitabhata *et al.* 2009; Nabhitabhata *et al.* 2017; Nabhitabhata *et al.* 2019). The present study reveals the richness of teuthofaunal resources in this transition zone of the Indo-Pacific region, awaiting further studies.

MATERIALS AND METHODS

The materials were collected from commercial fish landings from Thai waters. The collected specimens were fixed in 10% formalin and transferred for preservation in 75% ethyl alcohol (Roper and Sweeney 1983). The taxonomic definition of morphological terms and morphometry (counts, measurement and indices) followed Roper and Voss (1983), and Jereb *et al.* (2016). Abbreviations used in the present study, *i.e.*, DML = Dorsal Mantle Length (mm), VMLI = Ventral Mantle Length Index, MWI = Mantle Width Index, AL1I = First Arm Length Index, AL2I = Second Arm Length Index, AL3I = Third Arm Length Index, AL4I = Fourth Arm Length Index, WDAI = Web Sector A Depth Index, WDBI = Web Sector B Depth Index, WDCI = Web Sector C Depth Index, WDDI = Web Sector D Depth Index, WDEI = Web Sector E Depth Index, HLI = Head Length Index, HWI = Head Width Index, EDI = Eye Diameter Index, FNLI = Funnel Length Index, and FFNLI = Free Funnel Length Index. Indices (I) are expressed as a percentage of dorsal mantle length (DML). The specimens are deposited in Reference Collection of Phuket Marine Biological Center.

RESULTS

Superorder Octobranchia Fioroni, 1981

Order Octopoda Leach, 1818

Suborder Incirrina Grimpé, 1916

Family Octopodidae d'Orbigny, 1840

Genus *Abdopus* Norman and Finn, 2001

Diagnosis. Mantle muscular, ovoid to elongate shaped. Arm long, 4 to 8 times mantle length. Ocelli absent. Web depths moderate, web C deepest. Interbranchial web pouches absent. Arm suckers biserial. Enlarged suckers present in males. Right arm III of male hectocotylised.

Abdopus aculeatus (d'Orbigny, 1834)

Fig. 1, Table 1

Octopus aculeatus d'Orbigny 1834: 53–55, fig. 1–2, pl. 7, fig 1, pl. 8, fig. 3–5, pl. 23; - d'Orbigny 1845: 183; - d'Orbigny 1855: 183; - Norman and Sweeney 1997: 112–113, fig. 5d–e, table 3; - Norman 1998: 822.

Octopus (Abdopus) aculeatus - Norman and Finn 2001: 18–23, fig. 1–4, table 2–5.

Abdopus aculeatus - Norman *et al.* 2016a: 61–62, fig. 59–60, pl. I, 2; - Reid 2016: 340–342; - Nabhitabhata *et al.* 2017: 290–291, fig. 86; - Yalla and Mohanraju 2017: 409–413.

Material examined. PMBC 21213, 1 male (mantle length 25.4 mm), Phang Nga Bay, 20 December 2001.

Diagnosis. Mantle muscular, soft, surface irregular, dark brown coloured, lateral ridge absent. Ocelli absent. Supraocular papilla large, present on each eye. Arms long, 5 to 6 times mantle length, arm formula III>II>IV>I, suckers 192–266. Web depth 11 to 13% of arm length. Interbranchial web pouches absent. Right arm III hectocotylised, length 76% of left arm III, suckers 159. Arm III with 5–6 enlarged suckers at level 9th to 12th proximal sucker, diameter 15% of mantle length. Ligula length moderate, 2% of arm length, calamus short, less than 15% of ligula. Ink sac present. Anal flap present.

Distribution. Western Pacific Ocean from Taiwan, the Philippines, Indonesia, the Gulf of Thailand and Vietnam, to northern Australia (Norman 1998; Norman *et al.* 2016a; Norman *et al.* 2016b; Reid 2016), Indian Ocean, the West (Yalla and Mohanraju 2017) and the East Andaman Sea (present study).

Remarks. The distribution map of *A. aculeatus* of Norman *et al.* (2016a) included the Gulf of Thailand, but documented records and vouchers are not currently available for confirmation. In contrast, localities in the Andaman Sea are rather far away from the type locality, the Philippines, and previous records (Norman 1998; Norman *et al.* 2016a; Norman *et al.* 2016b; Reid 2016). This study is the first record of *A. aculeatus* from the East Andaman Sea, Thai Waters, supporting the record from the Indian Ocean, from the West Andaman Sea, the Andaman Island (Yalla and Mohanraju 2017). However, only one male specimen was available in the present study. *A. aculeatus* is suspected to be mixed with unidentified fished octopus. Norman *et al.* (2016a) also remarked that landing statistics of this species were previously under the name *Octopus horridus* d'Orbigny, 1826.

Table 1. Mantle length (DML, mm) and indices (index, %DML) of *Abdopus aculeatus*.

Index	N	
DML (mm)	1	25.4
VMLI	1	68.6
MWI	1	68.4
AL1I	1	500.2
AL12I	1	602.4
AL3I	1	622.4
AL4I	1	582.4
WDAI	1	13.2
WDBI	1	11.8
WDCI	1	11.4
WDDI	1	13.2
WDEI	1	12.6
HLI	1	62.9
HWI	1	53.8
EDI	1	24.3
FNLI	1	43.3
FFNLI	1	36.5



Figure 1. *Abdopus aculeatus* (d'Orbigny, 1834) (male, PMBC 21213).

Genus *Callisioctopus* Taki, 1964

Diagnosis. Mantle ovoid to elongate. Arms long, up to 5 times mantle length. Dorsal arms longest. Web depths moderate, dorsal web deeper than ventral web. Interbrachial web pouches absent. Arm suckers two rows, enlarged suckers absent in both sexes. Right arm III of male hectocotylised. Ocelli absent.

Callisioctopus nocturnus (Norman and Sweeney, 1997)
Fig. 2, Table 2

Octopus nocturnus Norman and Sweeney 1997: 117–118, fig. 6b–d, table 4; - Norman 1998: 816.
Callisioctopus nocturnus - Norman *et al.* 2016a: 107, fig. 107–108.

Material examined. PMBC 21214, two males (mantle length 35.9–40.0 mm), Sinsirichai Fish Landing, Nakhon Si Thammarat Province, 26 July 2008.

Diagnosis. Mantle muscular, soft, surface smooth, lateral ridge absent, cream coloured, white spots on dorsal mantle. Arm long, 3 to 5 times of mantle length, arm formula I>II>III>IV, suckers 180–220. Web depth 10–12% of arm length, web A deepest, E shallowest. Interbrachial web pouches absent. Right arm III hectocotylised, length 58–60% of left arm III, suckers 86–88. Ligula length up to 5% of arm length, calamus present, length 32–33% of ligula length. Ink sac present. Anal flap present.

Distribution. The South China Sea, Pacific Ocean, the Philippines (Norman 1998; Norman *et al.* 2016a; Norman *et al.* 2016b) and the Gulf of Thailand (present study).

Remarks. The present study is the first record of *Callisioctopus nocturnus*, outside its type locality in the South China Sea, the Philippines (Norman and Sweeney 1997), extending into the Gulf of Thailand, Thai Waters. Distribution in the Andaman Sea, Indian Ocean is still unknown.

Table 2. Mantle length (DML, mm) and indices (index, %DML) of *Callisioctopus nocturnus*.

Index	N	1	2
DML (mm)	2	35.9	40.0
VMLI	2	67.8	77.7
MWI	2	57.5	60.3
AL1I	2	587.1	594.6
AL2I	2	409.3	454.5
AL3I	2	364.7	382.0
AL4I	2	330.0	372.0
WDAI	2	12.5	12.5
WDBI	2	11.6	11.6
WDCI	2	10.4	11.3
WDDI	2	10.1	10.9
WDEI	2	9.9	10.5
HLI	2	77.4	85.4
HWI	2	44.4	48.4
EDI	2	24.2	25.2
FNLI	2	39.2	46.7
FFNLI	2	25.0	26.0



Figure 2. *Callisoctopus nocturnus* (Norman and Sweeney, 1997) (male, PMBC 21214).

DISCUSSION

In the present study two incirrate octopus species are newly recorded from new localities far away from their respective type localities in the Philippines, and previously known distributional record. The new record of *Abdopus aculeatus* from the East Andaman Sea extends its distribution range from the West Pacific (Norman *et al.* 2016a) into the Indian Ocean, supported what was previously recorded in the West Andaman Sea (Yalla and Mohanraju 2017). Occurrence of *Callisoctopus nocturnus* in the Gulf of Thailand extends the western range of distribution in the South China Sea (Norman *et al.* 2016a; Norman *et al.* 2016b).

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