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SHORT COMMUNICATION

A FIRST RECORD OF THE SMALLFIN GULPER SHARK *CENTROPHORUS MOLUCCENSIS* BLEEKER, 1860 (CHONDRICHTHYES: SQUALIFORMES: CENTROPHORIDAE) FROM THE ANDAMAN & NICOBAR WATERS, INDIAN EEZ

H.D. Pradeep, Swapnil S. Shirke, M. Nashad &
Monalisha Devi Sukham

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A first record of the Smallfin Gulper Shark *Centrophorus moluccensis* Bleeker, 1860 (Chondrichthyes: Squaliformes: Centrophoridae) from the Andaman & Nicobar waters, Indian EEZ

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H.D. Pradeep [1], Swapnil S. Shirke [2], M. Nashad [3] & Monalisha Devi Sukham [4]

[1] Fishery Survey of India, Mormugao Zonal Base, Opp. Microwave Station, Bogda Road, Mormugao, Goa 403803, India
[2,3] Fishery Survey of India, Port Blair Zonal Base, Port Blair, Andaman and Nicobar Islands 744101, India
[4] Fisheries Resource Management Division, Central Island Agriculture Research Institute, ICAR, Port Blair-744105, Andaman and Nicobar Islands, India
[1] hdpradeep@gmail.com (corresponding author), [2] lishanilforever@gmail.com, [3] nashadfsi@gmail.com, [4] smonalishadevi@gmail.com

Abstract: The Smallfin Gulper Shark *Centrophorus moluccensis* is reported for the first time from the Andaman & Nicobar waters of the Indian EEZ. A male specimen of 785mm total length and weighing 2.34kg was landed by a motorized longliner at Burmanallah, South Andaman District. The specimen was caught off Chidiyatapu, South Andaman at a depth of 250m. A detailed morphological description of the specimen and comparison with previous literature is provided.

Keywords: Andaman & Nicobar Islands, Centrophoridae, Dogfish Shark, longline, new report, squalene.

Abbreviations: HL - head length; PCL - pre-caudal length; TL - total length

Gulper sharks *Centrophorus* spp. are commercially exploited for food and high squalene content in their livers (Compagno 1984; Gordon 1999; Daley et al. 2002). They generally occur on upper continental and insular slopes between 200–2400 m depth (Compagno 1984; Last & Stevens 1994; Andrew et al. 1997; Graham et al. 2001; Compagno et al. 2005). Despite their importance as commercial target and by-catch species in a number of countries, poor sampling and taxonomic confusion has made identification of *Centrophorus* spp. often problematic (Compagno 1984; Muñoz-Chápuli & Ramos 1989; Compagno et al. 1989, 2005). Seven *Centrophorus* species are reported to occur in Indian waters: *Centrophorus granulosus* (Bloch & Schneider 1801); *C. uyato* Rafinesque 1810; *C. moluccensis* Bleeker 1860; *C. lusitanicus* Bocage & Capello 1864; *C. acus* Garman 1906; *C. squamosus* Bonnaterre 1788 and *C. atromarginatus* Garman 1913 (Nair & Mohan 1970; Appukuttan & Nair 1988; Raje et al. 2002; Venu & Kurup 2002; Soundararajan & Roy 2004; Titto D'Cruz 2004; Jayaprakash et al. 2006; Raje et al. 2007; CMFRI 2007; Joshi et al. 2008; Vivekanandan & Sivaraj 2008).

The global distribution of the Smallfin Gulper Shark is uncertain due to taxonomic issues. It has been reported from sporadic locations through the western Indian Ocean: India, South Africa, and southern Mozambique. The most abundant distribution was noted in the Indo-

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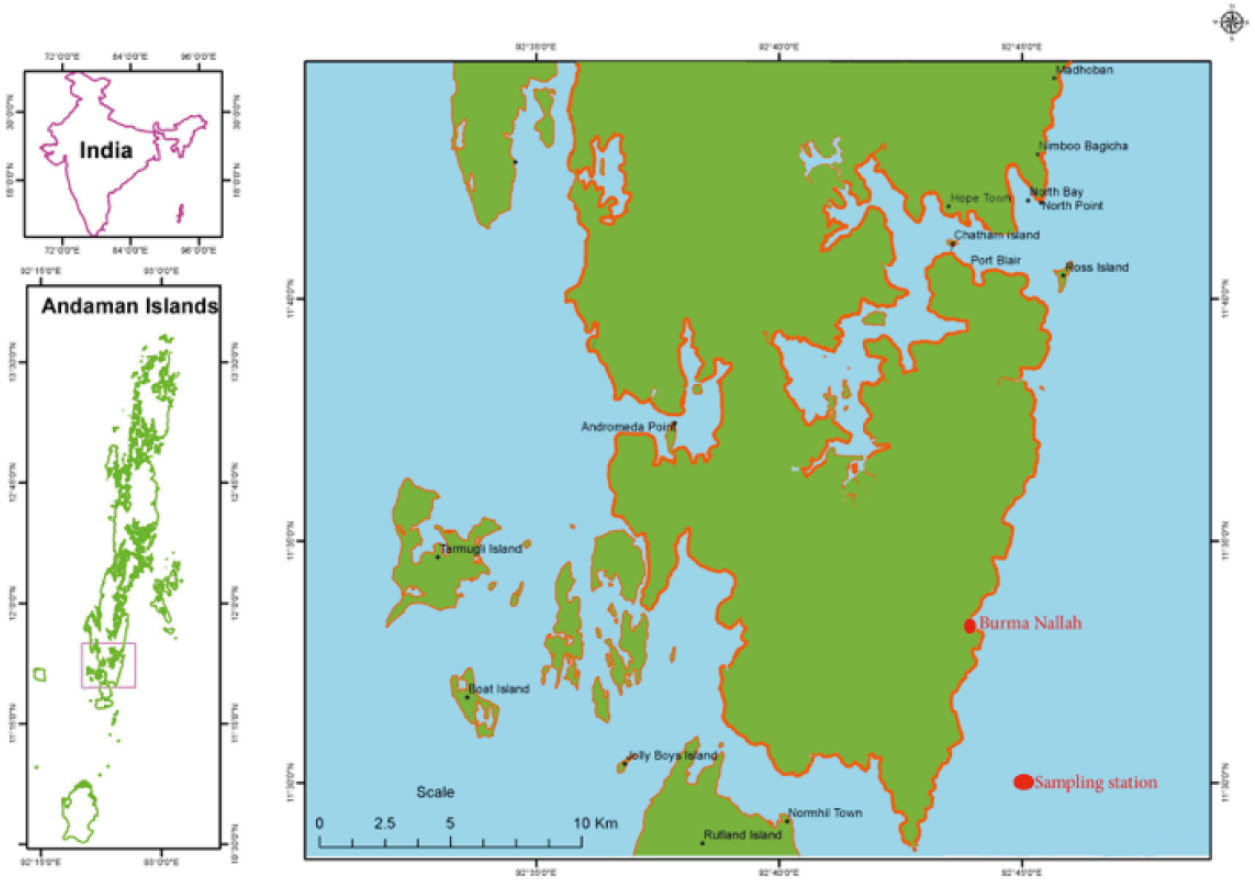

Figure 1. Map showing the sampling station. Courtesy: M. Nashad

West Pacific region, including eastern and western Australia, New Caledonia, Indonesia, Philippines, Malaysia, Taiwan and Japan (Compagno 1984; Talwar & Jhingran 1991; Last & Stevens 2009; Ahmad & Lim 2012). From Indian waters, it is reported from the southwestern coast and Gulf of Mannar (Silas 1969; Hamsa et al. 1991) but detailed morphometric description of the species is lacking. From Andaman & Nicobar waters till today only two squaliform dog fishes, *Centrophorus acus* and *Squalus megalops* are reported (Soundararajan & Roy 2004). The present study reports the occurrence of *C. moluccensis* from the Andaman & Nicobar waters of the Indian Exclusive Economic Zone (EEZ) for the first time, along with its morphometric details.

Materials and Methods

The sample was collected from the landing centre at Burmanallah, South Andaman District (Fig. 1) on 23 July 2016, landed by a motorized fishing boat. The specimen was captured by longline gear at a depth of 250m off Chidiyatapu, South Andaman District. A single male specimen of *Centrophorus moluccensis* Bleeker, 1860 was landed along with other species of Squalidae, which are exclusively fished for squalene content in their liver in these Islands. The specimen was identified following Compagno & Niem (1998), photographed and morphometric data were recorded. Morphometric measurements of the fresh specimen were taken following Compagno (1984) with a few modifications. The photos of the scales were taken by Olympus CX 41 trinocular microscope with 10x magnification. All proportional measurements are expressed as percentage of total length (TL) along with original data. The specimen is deposited in the museum of Zonal Base of Fishery Survey of India, Port Blair (Referral No. MUS. FSI.PB/EB/07/2016).

Results

Systematics

Order: Squaliformes Compagno, 1973

Family: Centrophoridae Bleeker, 1859

Genus: *Centrophorus* Müller & Henle, 1837

Centrophorus moluccensis Bleeker, 1860

(Image 1)

Specimen Examined: *C. moluccensis* Bleeker, 1860: Male (adult), 785mm total length (TL), 2.34kg total

Image 1. Dorsolateral view of *C. moluccensis* Bleeker, 1860

weight.

Diagnosis: Body elongated and slightly compressed; snout pointed, teeth in the two jaws markedly different, small and with a single cusp, lower teeth much larger than upper (Image 2). Two dorsal fins; origin of first dorsal fin close behind pectoral fin bases; each dorsal fin with a spine on its anterior margin. Second dorsal fin very small, ½ height of first dorsal fin or less, with spine origin usually well posterior to pelvic fin rear tips. Caudal fin with sub terminal notch. Caudal peduncle without dermal keels and precaudal pits. Dermal denticles of back widely separated and not overlapping, low-crowned, broad with low ridges running the length of the crown and a short cusp on their posterior edges (Image 3). PCL: 74.62 % of TL; HL: 17.44% of TL; second dorsal fin height is only 49.5 % of first dorsal fin height.
Detailed morphometric measurements of the present specimen in comparison with *C. moluccensis,* one specimen: AMS E.5211, holotype of *C. scalpratus* Mc Culloch, female, 870mm TL, collected from the Victorian coast, Australia (Duffy 2007) are given in Table 1.
Colour: Grey-brown above, lighter below and fins slightly darker.

Discussion

Dogfish sharks often occur in shoals and are caught by trawlers at great depths. In the western Pacific region, squalids are caught in line fisheries for their squalene-rich liver. Among the squalids, *C. moluccensis (Centrophorus scalpratus* Mc Culloch and *Atractophorus armatus* Gilchrist) are very common in South Africa and Mozambique waters (Hamsa et al. 1991). The IUCN Red List of Threatened Species lists the status of *C. moluccensis* as "Data Deficient" (Graham & Kyne 2013) and the status of its eastern Australian subpopulation is "Near Threatened" (Graham 2013).

The diversity of the elasmobranch in the Indian EEZ needs to be studied in detail. Silas (1969) recorded the occurrence of *C. moluccensis* in the trawl catches from the upper continental slope off the southwest coast of India at depths of 180–450 m. A rare case of landings of *C. moluccensis* occurred in Veerapandipatnam, Gulf of Mannar at a depth of 200m (Hamsa et al. 1991).

Identification of *Centrophorus* spp. can be difficult owing to taxonomic confusion; however the specimen examined herein agrees well with type material of *C. moluccensis* (Duffy 2007). The morphometric details of the present study shows maximum standard deviation value of 4.6 in the case of pre-caudal length and 2.4 in head length with the type specimen. Akhilesh et al. (2014) mentioned that the taxonomic problems with regard to Squaliformes needs to be resolved, which could lead to a greater known diversity in Indian seas and out of 24 squaliform shark species listed from India, 54% have uncertain taxonomic status. Further, it was also mentioned that the report of *C. moluccensis* in Indian waters needs confirmation. Bineesh et al. (2016) analysed the species composition of sharks and rays in the Indian commercial fishery using DNA barcoding and 11 elasmobranch species were confirmed as first records for Indian waters. Among the 11 species, five belonged to Centrophoridae, however, *C. moluccensis* was not

Table 1. Morphometric details of *C. moluccensis* (in mm and %TL) in comparison with the holotype specimen

	Present specimen (male)		AMS.E.5211 (Holotype) female, 875mm TL (Duffy 2007)	
Characters	**Length (mm)**	**% TL**	**% TL**	**SD**
Total length (mm)	780	100	100	-
Fork length	695	89.10	88	0.8
Pre-caudal length	582	74.62	81.1	4.6
Pre-second dorsal length	505	64.74	67.3	1.8
Pre-first dorsal length	240	30.77	31.1	0.2
Head length	136	17.44	20.9	2.4
Prenasal length-snout outer nostril	25.30	3.24	3	0.2
Prenasal length-outer (direct)	31.25	4.01	4.7	0.5
Preobital length	34.10	4.37	5.1	0.5
Prespiracular length	83.40	10.69	11.9	0.9
Preoral length	73.25	9.39	9.5	0.1
Prebranchial length	134.36	17.23	17.5	0.2
Prepectoral length	162.10	20.78	19.8	0.7
Prepelvic length	424.00	54.36	56.8	1.7
Snout vent length	425.60	54.56	57.1	1.8
Snout- lower caudal	572.00	73.33	74.5	0.8
Interdorsal space	195.00	25	24.2	0.6
Pectoral pelvic space	226.30	29.01	31.7	1.9
Pelvic caudal space	112.00	14.36	14.9	0.4
Nostril width	12.1	1.55	1.9	0.2
Internarial space	24.3	3.12	2.9	0.2
Inner nostril to upper labial furrow	46.5	5.96	5.9	0.0
Mouth width	51.3	6.58	6.6	0.0
Upper labial furrow length	16.30	2.09	2.1	0.0
Lower labial furrow length	9.80	1.26	1.3	0.0
Interorbital space	61.9	7.94	7.4	0.4
Eye length	39.80	5.10	5.1	0.0
Eye height	14.20	1.82	1.8	0.0
Spiracle length	6.93	0.89	1	0.1
Spiracle height	10.92	1.4	1.3	0.1
First gill slit height	16.35	2.10	2.2	0.1
Fifth gill slit height	19.70	2.53	2.3	0.2
Pectoral anterior margin	118.10	15.14	13.5	1.2
Pectoral base	42.20	5.41	6.9	1.1
Preventral caudal margin	112.10	14.37	13.1	0.9
First dorsal base	89.22	11.44	12.6	0.8
First dorsal height	51.5	6.60	6.2	0.3
Exposed first dorsal spine length	21	2.69	0	-
Second dorsal soft fin length	41.30	5.29	5.7	0.3
Second dorsal base	53.00	6.79	7.1	0.2
Second dorsal height	25.50	3.27	3.3	0.0
Exposed second dorsal spine length	15.60	2	1.9	0.1
Pelvic length	80.30	10.29	9.5	0.6
Pelvic height	40.60	5.21	4.9	0.2
Head width at anterior nostrils	44.3	5.68	5.7	0.0
Head width at anterior mouth	79.3	10.17	9.6	0.4
Head width	96.23	12.34	11.4	0.7

Image 2. Teeth of *C. moluccensis*: A - upper jaw; B - lower jaw

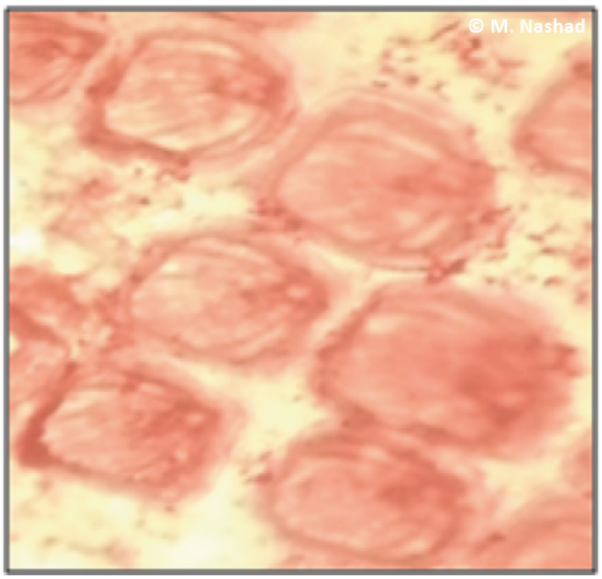

Image 3. Dermal denticles of *C. moluccensis*

sequenced and confirmed by DNA barcoding. From Andaman & Nicobar waters, only *C. acus* and *Squalus megalops* have been reported by Soundararajan & Roy (2004). The present study confirms the occurrence of *C. moluccensis* from Indian waters and also reports the species for the first time from the Andaman & Nicobar waters of the Indian EEZ, thus adding one more species to the list of squaline dogfishes from these waters.

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Communication

Flies matter: a study of the diversity of Diptera families (Insecta: Diptera) of Mumbai Metropolitan Region, Maharashtra, India, and notes on their ecological roles
-- Aniruddha H. Dhamorikar, Pp. 10865–10879

Short Communications

Small carnivores of the montane forests of Eravikulam National Park in the Western Ghats, India
-- S. Nikhil & P.O. Nameer, Pp. 10880–10885

Distribution and population of Himalayan Marmot *Marmota himalayana* (Hodgson, 1841) (Mammalia: Rodentia: Sciuridae) in Leh-Ladakh, Jammu & Kashmir, India
-- Vipin Chaudhary, R.S. Tripathi, Surjeet Singh & M.S. Raghuvanshi, Pp. 10886–10891

First record of Bourret's Horseshoe Bat *Rhinolophus paradoxolophus* (Mammalia: Chiroptera: Rhinolophidae) from Myanmar with a review of the taxonomy, distribution and ecology of the species
-- Sai Sein Lin Oo, Du Sar No, Lucia Nang Seng, Ngwe Lwin, Malcolm Pearch & Paul J.J. Bates, Pp. 10892–10898

A first record of the Smallfin Gulper Shark *Centrophorus moluccensis* Bleeker, 1860 (Chondrichthyes: Squaliformes: Centrophoridae) from the Andaman & Nicobar waters, Indian EEZ
-- H.D. Pradeep, Swapnil S. Shirke, M. Nashad & Monalisha Devi Sukham, Pp. 10899–10903

Taxonomic revision of the genus *Atmetonychus* (Coleoptera: Curculionidae: Entiminae) from the Indian subcontinent
-- G. Mahendiran & V.V. Ramamurthy, Pp. 10904–10908

A new species of dewflower *Murdannia sanjappae* (Commelinaceae) from Andaman Islands, India
-- Mudavath Chennakesavulu Naik & Boyina Ravi Prasad Rao, Pp. 10909–10913

First records of two Ginger Lilys *Hedychium* (Zingiberaceae) species from the Western Ghats, India
-- Sinjumol Thomas, Susai John Britto & Bince Mani, Pp. 10914–10919

An annotated checklist of microbes associated with bamboo in the Indian subcontinent
-- O.K. Remadevi, P. Sharada & H.C. Nagaveni, Pp. 10920–10947

Notes

Roadkill records of Lowland Tapir *Tapirus terrestris* (Mammalia: Perissodactyla: Tapiridae) between kilometers 06 and 76 of highway BR-163, state of Pará, Brazil
-- Marco A. de Freitas, Rodrigo C. Printes, Eric K. Motoyama, Assor E. Fucks & Diogo Veríssimo, Pp. 10948–10952

Population size, herd structure and sex ratio of the Blackbuck *Antilope Cervicapra* (Mammalia: Cetartiodactyla: Bovidae) in a human dominated area in Odisha, India
-- Subrat Debata, Pp. 10953–10955

Recovery of Musk Deer *Moschus chrysogaster* Hodgson, 1839 (Artiodactyla: Moschidae) in Sakteng Wildlife Sanctuary, Bhutan
-- Sonam Tobgay, Thinley Wangdi & Kumbu Dorji, Pp. 10956–10958

First record of the Asiatic Brush-tailed Porcupine *Atherurus macrourus* Linnaeus, 1758 (Mammalia: Rodentia: Hystricidae) from western Bhutan
-- Tashi Dhendup & Rinzin Dorji, Pp. 10959–10960

The Vulnerable Indian Skimmer *Rynchops albicollis* Swainson, 1838 (Aves: Charadriiformes: Laridae) breeding in Odisha, eastern India
-- Subrat Debata, Tuhinansu Kar, Kedar Kumar Swain & Himanshu Shekhar Palei, Pp. 10961–10963

On the occurrence of Black Baza *Aviceda leuphotes* Dumont, 1820 (Aves: Falconiformes: Accipitridae) in the Gupteswar forests of the Eastern Ghats, Odisha, India
-- Swetashree Purohit, Manoj V. Nair & Sharat Kumar Palita, Pp. 10964–10967

New locality records of the Stout Sand Snake *Psammophis longifrons* Boulenger, 1890 (Reptilia: Squamata: Lamprophiidae) in Telangana, India
-- Avinash C. Visvanathan, Sandeep Anne & Aditya Kesav Kolli, Pp. 10968–10970

A note on the distribution of two highly threatened butterflies in Sri Lanka (Lepidoptera: Lycaenidae: *Spindasis greeni* and *Rapala lankana*), with a report on the range extension of *S. greeni*
-- Tharaka Sudesh Priyadarshana, Ishara Harshajith Wijewardhane & Mithila Karunarathna, Pp. 10971–10973

A new record of grass *Ottochloa* (Poaceae) to the Eastern Ghats, India
-- Midigesi Anil Kumar, P. Anjaneyulu & Boyina Ravi Prasad Rao, Pp. 10974–10976

An extended distribution of Natesh's Cape-pondweed *Aponogeton nateshii* (Aponogetonaceae), a new record to the state of Goa
-- Rutuja Rajendra Kolte, Anup Satish Deshpande, Prabha Muraleedharan Pillai & Shrirang Ramchandra Yadav, Pp. 10977–10979

Detection of *Artyfechinostomum sufrartyfex* - a zoonotic parasite from the Small Indian Mongoose *Herpestes auropunctatus* (Mammalia: Carnivora: Herpestidae) in Jammu & Kashmir, India
-- Sanku Borkataki, Pankaj Goswami, Rajesh Katoch, Sahil Kumar & Pratiksha Raghuvanshi, Pp. 10980–10982

Book Review

Requisite for long term studies in ecology
-- S. Suresh Ramanan, Pp. 10983–10984