

Report on Unknown Form, hitherto, of the Genus *Octopus* from Eastern Coast of Korea

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ABSTRACT

A specimen of the unknown form of *Octopus* species was collected from Onsan, Kyung-sangnam-do, eastern coast of Korea on 20th June 2004 with a bottom trawl. The specimen distinguished from the other *Octopus* species reported hitherto by its extremely short 2nd pair of arm and hectocotilization of the right 4th arm. It may be described, therefore, as new species, but only one specimen was collected unfortunately. A new name will be deferred, consequently, until more specimens will be available in the future.

Key words: unknown *Octopus*, Eastern coast, Korea.

INTRODUCTION

Four *Octopus* species (*O. vulgaris*, *O. dofleini*, *O. minor* and *O. ocellatus*) were recorded in the Korean waters so far (Je *et al.*, 1990). A strange *Octopus* specimen, however, was collected from the eastern coast of Korea. The result of examination of this specimen revealed that this is closely related to *Octopus vulgaris* and *O. dofleini*, but is distinguishable from all of the previously known forms by some important morphological characters, such as feature of the 2nd arm in both side and the hectocotilized arm. The present report, therefore, is aiming at providing information of existence of probable differentiated form of the genus *Octopus*.

MATERIALS AND METHODS

A single specimen of strange octopod belonging to the genus *Octopus* was sampled together with a number of other marine invertebrates on 20th June

2004 with a bottom trawl (ca. 30 m in depth) from Onsan, Kyung-sangnam-do, the eastern coast of Korea (N35°25'556" , E129°22'274"). Linear morphological characters were measured with a vernier calipers and a measuring tape before fixation. After linear measuring, the specimen was fixed with 5% seawater-formalin solution neutralized with sodium borate. Drawing was made with the aid of a transparent plastic-box and a dissecting microscope.

RESULTS

Description of unknown species

Octopus sp.

(Fig. 1)

Material examined: Holotype. a male in a fine state; collected with a bottom trawl (ca. 30 m in depth) in the eastern coast of Korea (Onsan) ; 20th June 1995; collected by M.H. Son; deposited at the museum of Marine Eco-technology Institute in the preserved condition with 5% neutralized formalin-seawater solution.

Systematic account

Order Octopoda Leach, 1817

Suborder Incirrata Grimpe, 1916

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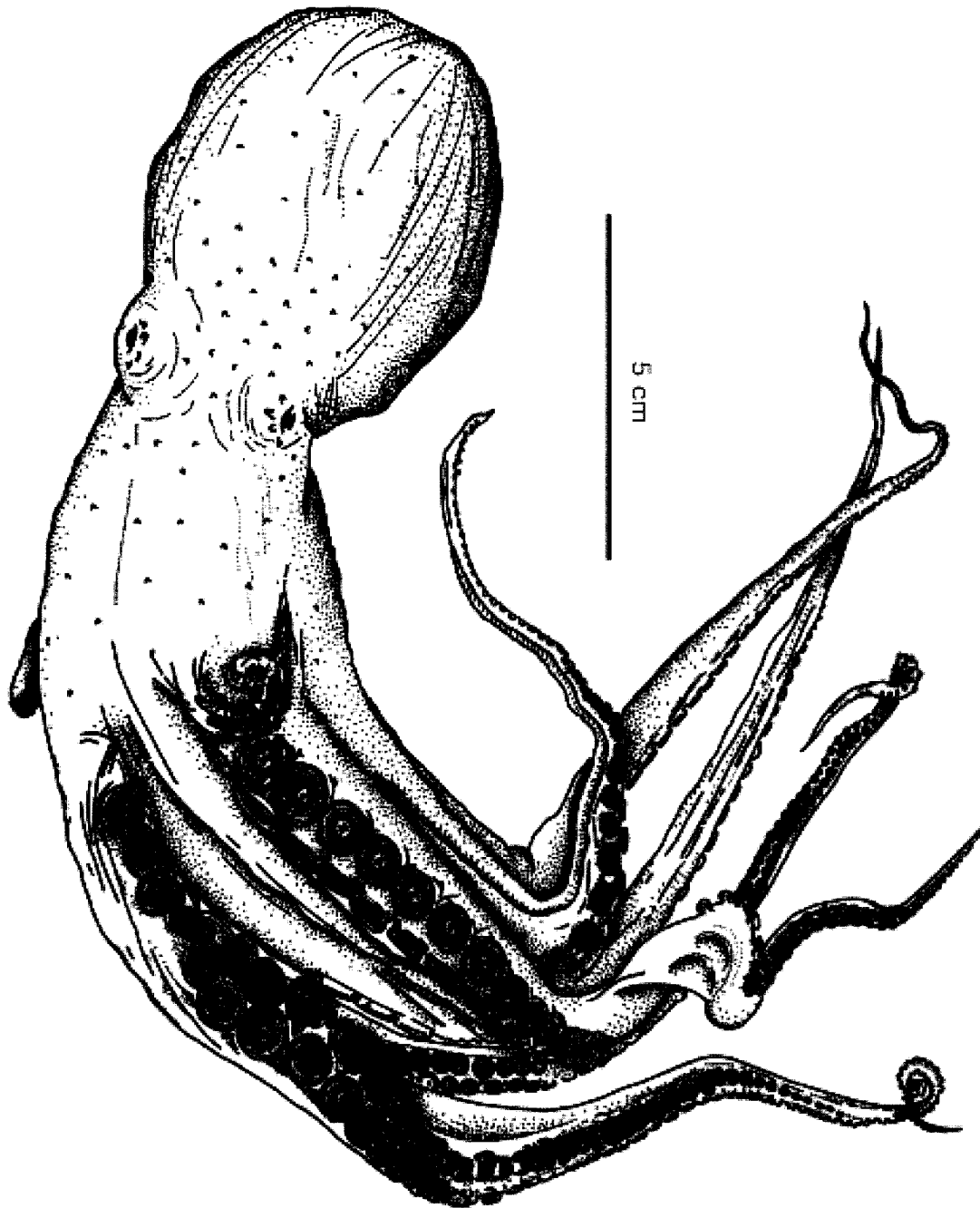


Fig. 1. Unknown *Octopus* species collected on 20th June 2004 with a bottom trawl (ca. 30 m in depth) from Onsan, Kyungsangnam-do, the eastern coast of Korea (N35°25'556", E129°22'274").

Family Octopodidae d'Orbigny, 1838
Subfamily Octopodinae Grimpe, 1921
Genus *Octopus* Cuvier, 1797

Description. The specimen is male. The mantle is plump, sac-shaped, rounded posteriorly and slightly wider than long. The small warts with longitudinal tubercles and sparse pimples cover the whole dorsal

Table 1. Measurements of the body of the unknown *Octopus* species collected on 20th June 2004 from the Korean Waters

Character	Total length	Mantle			Arm length							
		Dorsal length	Dorsal width	Head width	Right				Left			
					1st	2nd	3rd	4th	1st	2nd	3rd	4th
Measurement (mm)	340.9	52.2	52.6	37.9	184	52	185	133	224	50	189	190

Table 2. Comparison of morphological characters between the present specimen and two closely related *Octopus* species

Character	The present specimen	<i>Octopus vulgaris</i>	<i>Octopus dofleini</i>
Surface feature of skin	Warty with longitudinal tubercles and sparse pimples	Warty with longitudinal tubercles	Ornamented with many pointed parts that are frequently connected each other
Number of cirri around eye	4	4	3-4
Condition of web	Poor-developed	Well-developed	Well-developed
Arrangement of suckers	Biserial in zigzag	Biserial	Biserial except a proximal part
Number of suckers/Arm	102-238	160-180	250-300
Position of enlarged sucker	3rd from base of left 1st arm	8th from base of right and left 3rd arms	8-9th from base of all arms
Hectocotylized arm	Right 4th arm	Right 3rd arm	Right 3rd arm
Arm formula	1 > 4 > 3 > 2	2 > 3 > 4 > 1	1 ≥ 2 ≥ 3 > 4 or 1 > 2 ≥ 3 > 4

surface of the mantle, head and the outer side of the proximal part of both dorsal pairs of arms. The arms are well developed except the 2nd pair of arm. The 2nd pair of arm abruptly extruded between the 1st and 3rd arms. There are biserial suckers on the arms even though the 2nd pair of arm except the hectocotylized part of the right 4th arm. Hectocotylized portion in the arm is 4.1 mm which is 3% of total arm length. The transformation of the right 4th arm into a hectocotylus is caused by modification of the small spoon-shaped tip gradually. The right 4th arm is shortest in the arms except the 2nd pair of arm (Table 1). The spoon-shaped terminal part ends in a sharp point. The largest suckers distribute in the proximal part of the arms. Diameter of the largest sucker (at 3rd from base on the left 1st arm) is 12.95 mm. The arms bear weakly developed membranes. There are four prominent warts on the dorsal side of the eye lid.

DISCUSSION

The specimen distinguished from *Octopus vulgaris*

and *O. dofleini* by several morphological characters especially in its extremely short 2nd pair of arm and hectocotilization of the right 4th arm (Table 2). While records of abnormal growth, loss of arms or parts of arms, and regeneration of lost parts are numerous among the octopus (Lane, 1957), but morphology of the 2nd right and left arms is quite different from those records. The foregoing phenomena have been well reviewed by Lange (1920).

The specifically and abruptly enlarged suckers of a male, for instance the several large suckers in the proximal part on the left 1st arm, functions as 'an apparatus copulator (fixator)' in copulation (Robson, 1932). Related with octopod copulation, the 3rd arm of the right side is modified for copulation in all Octopodinae except *Scaevargus* and *Pteroctopus*, in which the 3rd arm of the left side is thus modified (Robson, 1932). The present specimen, however, shows the hectocotilization of the right 4th arm. Morphological characteristics of the hectocotylized arm, consequently, are different from those of other *Octopus* species reported so far. About possibility of

structural abnormalities, for instance the short 2nd right and left arms and hectocotilization of the right 4th arm shown in the present specimen, Robson (1932) reported that among the specimens which I have examined structural abnormalities are very uncommon, and the literature of the *Octopus* group contains few records of such phenomena. In addition, age and sex do not seem to have any influence whatever on the relative size of the arms in adults (Robson, 1932). Perhaps the most constant feature is the small size of the 1st arms in the *Octopus* species (*ibid*, p. 25). As far as the present specimen is concerned, the short arms seem to be a normal condition and not the regenerated arms of accidentally cut arms. If this is not abnormal, therefore, this is an exceptional case among *Octopus* species. It may be described, therefore, as new

species, but a new name will be deferred until more specimens will be available in future.

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