ISSN 1226-9999 (print)
ISSN 2287-7851 (online)

Korean J. Environ. Biol. 33(3) : 274~278 (2015) http://dx.doi.org/10.11626/KJEB.2015.33.3.274

A New Record of Glycerid Polychaete, *Glycera fallax* (Polychaeta: Glyceridae) from Korea

Hyun Ki Choi, Tae Won Jung[1] and Seong Myeong Yoon[2,*]

Department of Biotechnology, Chosun University, Gwangju 501-759, Korea
[1]*Marine Biodiversity Institute of Korea, Seochun 325-902, Korea*
[2]*Department of Biology, Chosun University, Gwangju 501-759, Korea*

Abstract - A newly recorded glycerid polychaete collected from mud of the tidal flat in the southwestern coast of Korea is identified as *Glycera fallax* Quatrefages, 1850 based on the morphologies of papaillae and ailerons on proboscis, parapodial postsetal lobes, and branchiae. In this paper, we provide a detailed description and illustration of Korean materials of this species and a key to the species of the genus *Glycera* from Korean waters.

Key words: *Glycera fallax*, polychaetes, glycerids, taxonomy, Korea

INTRODUCTION

The genus *Glycera* Lamarck, 1818 is one of the largest groups in the glycerids and distributed worldwide from the intertidal to deep sea (Fauchald and Jumars 1979; Böggemann 2002, 2009; Rizzo *et al*. 2007). Recent increasing of our knowledge on the taxonomy of genus *Glycera* was accomplished by Böggemann (2002), who revised more than hundred species of worldwide *Glycera* including re-examination of the type materials of almost species available. He finally listed only 36 *Glycera* species as valid ones (Böggemann 2002). Thereafter, nine new species were added by several studies on the genus *Glycera* (Imajima 2003, 2009; Rizzo *et al*. 2007; Böggemann 2009; Böggemann *et al*. 2012; Magalhaes and Rizzo 2012).

In Korean waters, nine *Glycera* species, *G. alba* (Müller, 1776), *G. capitata* Örsted, 1843, *G. chirori* Izuka, 1912, *G. convoluta* Keferstein, 1862, *G. decipiens* Marenzeller, 1879, *G. dentribranchia* Lee, 1985, *G. onomichiensis* Izuka, 1912, *G. rouxii* Audouin and Milne Edwards, 1833, and *G. subaenea* Grube, 1878, have been recorded (Paik 1975, 1978, 1982, 1989; Rho and Song 1974, 1975; Lee 1984). However, the Korean fauna of *Glycera* is in need of a detailed revision including re-evaluation of several recorded species that have to be synonymized as follows: *G. chirori* was synonymized into *G. nicobarica* Grube, 1868; *G. convoluta* into *G. tridactyla* Schmarda, 1861; *G. decipiens* into *G. nicobarica*; *G. rouxii* into *G. unicornis* Lamarck, 1818; *G. subaenea* into *G. macintoshi* Grube, 1877 (Böggemann 2002; Imajima 2003).

During investigating on the glycerid polychaetes, the authors met with the materials of *G. fallax* Quatrefages, 1850 new to Korean fauna. In this study, we describe this species with detailed description and illustration, and provide a key to *Glycera* species from Korean waters.

MATERIALS AND METHODS

Samples were collected from mud of the tidal flat in the southwestern coast of Korea. The specimens were sorted by using sieves with a pore size of 0.5 mm, fixed initially with

* Corresponding author: Seong Myeong Yoon, Tel. 062-230-7018, Fax. 062-230-7018, E-mail. smyun@chosun.ac.kr

5% formaldehyde-seawater solution, and transferred to 85% ethyl alcohol after sorting in the laboratory. The characteristics of the whole body were observed and the appendages were dissected in a petri dish by using dissection forceps or surgical knives and needles under stereomicroscope (SMZ 1500; Olympus, Tokyo, Japan). Dissected specimens were mounted on temporary slides using glycerol or permanent slides using polyvinyl lactophenol solution. Drawings were made by the stereomicroscope and light microscope (LABOPHOT-2; Nikon, Tokyo, Japan) with the aids of drawing tubes. The examined materials are deposited in Chosun University and the National Institute of Biological Resources (NIBR) in Korea.

RESULTS AND DISCUSSION

Class Polychaeta Grube, 1850 다모 강
Order Phyllodocida Örsted, 1843 부채발갯지렁이 목
Family Glyceridae Grube, 1850 미갑갯지렁이 과
Genus *Glycera* Savigny, 1818 참미갑갯지렁이 속

1. *Glycera fallax* Quatrefages, 1850
구슬아가미미갑갯지렁이 (신칭) (Fig. 1)

Synonyms: *Glycera fallax* Quatrefages, 1850: 358; Böggemann, 2002: 59, Figs. 73-75.

Glycera gigantea Fauvel, 1923: 387, Fig. 152d-k; Berkeley and Berkeley, 1941: 34; Hartman, 1950: 75; Imajima and Hartman, 1964: 162; Day, 1967: 362, Fig. 16.2l-n.

Material examined: Korea, 4 specimens, Jeollanam-do, Muan-gun, Hyeongyeong-myeon, Haeun-ri (126°25′40″E, 35°03′33″N) 19 Dec 2011, Choi HK.

Description: Body smooth, about 33.0 mm long with 95 segments and width 1.5 mm including parapodium at 20th setiger; life color red, whitish brown in alcohol. Body rings biannulated; anterior annulus with parapodia and dorsal cirri; posterior annulus slightly longer than anterior ones (Fig. 1A, B).

Prostomium large conical-shaped, consisted of 10 or 11 rings, and length slightly longer than basal width; 4 short antennae present on anterior end (Fig. 1A, B).

Proboscis bat-shaped, with 4 sickle-shaped jaws on anterior end and vertical white rows on mid-region (Fig. 1A, B), and closely covered with 2 kinds of soft papillae; most papillae long oval shaped and with 3 ridges (Fig. 1C), and remaining other papillae broadly subglobular form without ridges (Fig. 1D).

Ailerons (jaw support) with single prolongation and subtriangular base, without denticle (Fig. 1E).

Parapodia uniramous on first 2 setigers, and biramous on following setigers with 2 presetal and 2 postsetal lobes. Presetal lobes of parapodia digitiform, pointed distally, deeply divided, and much longer than postsetal lobes; notopodial lobes on anterior and mid-body regions as long as neuropodial lobes, and notopodial and neuropodial lobes on posterior region nearly equal in length. Postsetal lobes of parapodia short, blunt, slightly divided, and nearly equal in length; notopodial lobes bluntly triangular in shape on anterior regions, but bluntly rounded on mid-body and posterior region, and neuropodial lobes bluntly rounded (Fig. 1F-K).

Dorsal cirrus from 3rd parapodium, oval-shaped, attached above parapodial basis (Fig. 1F-K).

Ventral cirrus large, slender, triangular-shaped, and shorter than presetal lobes but longer than postsetal lobes (Fig. 1F-K).

Branchiae (Fig. 1H) single, blister-like in shape, attached on anterior surface of parapodia, present on 45-60 segment regions, and usually retractile state (Fig. 1F).

Remarks: *Glycera fallax* had long been ignored because of its poor original description (Quatrefages 1850). Instead of this species, *G. gigantea* Quatrefages, 1866 had long been widely known in the genus *Glycera* (Fauvel 1923; Berkeley and Berkeley 1941; Hartman 1950; Imajima and Hartman 1964; Day 1967). However, recent work revealed that *G. fallax* is a valid species and *G. gigantea* is a junior synonym of *G. fallax* based on the examination of their type materials (Böggemann 2002).

In this study, the authors examined the *Glycera* materials from Korean waters, and could find that those can be classified as *G. fallax* according to the following distinguishable characteristics: the proboscis has the conical papillae bearing three ridges and subglobular papillae; the ailerons have sub-triangular bases; the postsetal lobes on mid-body are blunt and more or less rounded, and the length of them are nearly similar; the branchiae are simply retractile and blister-like on the anterior surface of parapodia (Böggemann 2002). However, a minor difference is observed in Korean

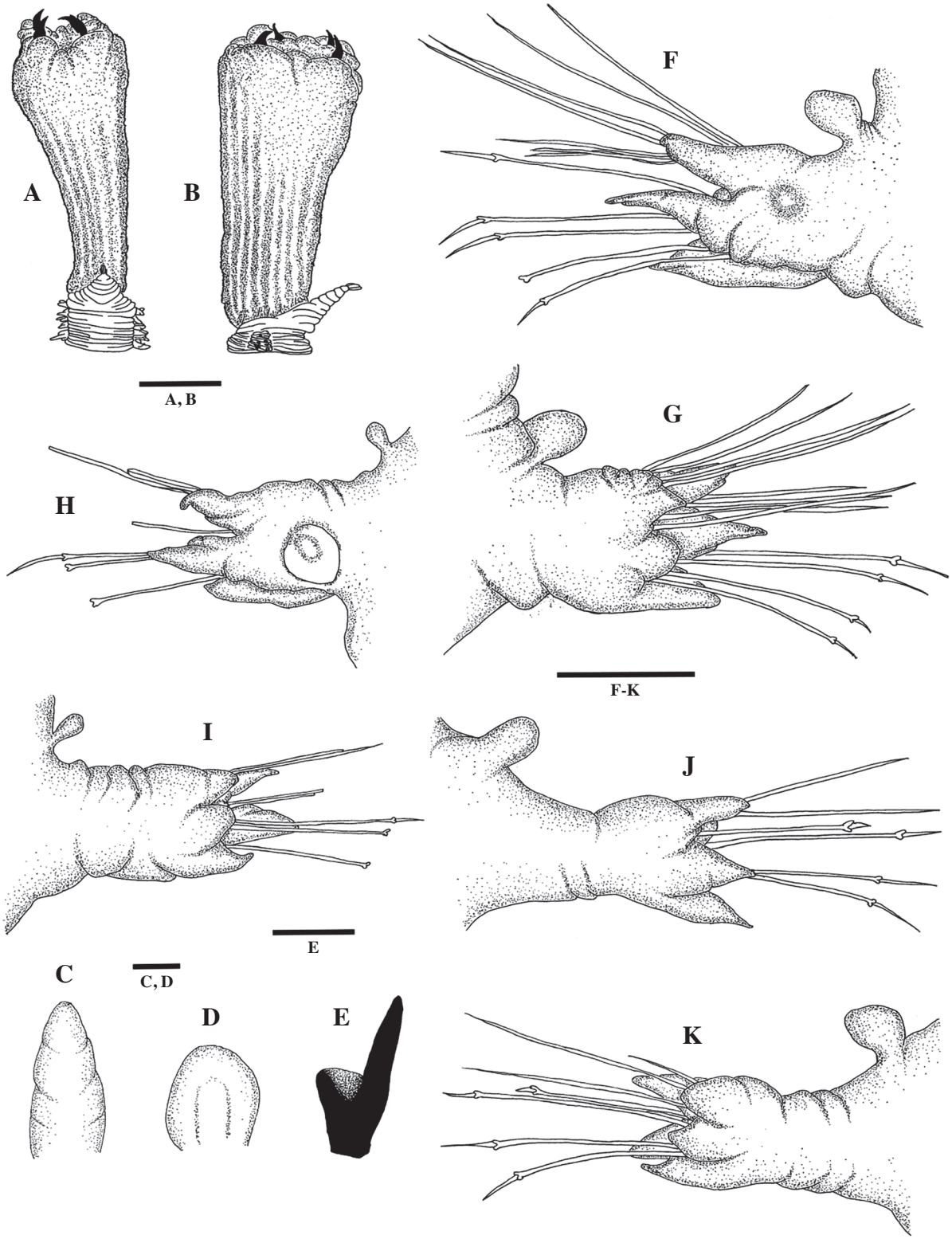

Fig. 1. *Glycera fallax* Quatrefages, 1850. A, B, anterior end, dorsal (A) and lateral (B) views; C, D, proboscidial papillae; E, aileron (jaw support); F, G, 25th parapodium, anterior (F) and posterior (G) views; H, I, 55th parapodium, anterior (H) and posterior (I) views; J, K, posterior segment parapodium, anterior (J) and posterior (K) views. Scale bars: A, B = 1.0 mm, C-H = 0.2 mm, I, J = 0.01 mm, K = 0.1 mm.

materials in the number of prostomial ring, 10 or 11 rings are in Korean materials while 14-17 rings are in the type materials of *G. fallax* (Böggemann 2002).

Among *Glycera* species known from Korean waters, *G. unicornis*, which was previously reported as *G. rouxii*, is appeared to be closely resembled with *G. fallax* in the following common diagnostic features: conical-shaped papillae with three ridges on the proboscis, two postsetal lobes of nearly equal length, and retractile branchiae (Lee 1984; Paik 1989; Böggemann 2002). However, these two species differ from each other in term of the postsetal lobes and branchiae: the postsetal lobes on mid-body of *G. fallax* are blunt and more or less rounded usually, while those of *G. unicornis* are slender and triangular-shaped; the parapodia on mid-body possess simply blister-like branchiae in *G. fallax*, but those in *G. unicornis* possess one or two digitiform ones (Böggemann 2002).

Habitat: This species was collected from mud of the tidal flat in the southwestern coast of Korea.

World distribution: North Atlantic, New Britain, Western and Southern Europe, Mediterranean, Laccadive Sea, Northeastern Australia, Northeastern Pacific Ocean, Southern California, Panama, Japan, Korea.

Deposition: NIBRIV0000307827.

Identifiers: Hyun Ki Choi, Seong Myeong Yoon.

Key to the species of genus *Glycera* from Korea

1. Probocidial papillae without terminal fingernail structure ····2
− Probocidial papillae with terminal fingernail structure ····7
2. All parapodia with single postsetal lobe ····*G. capitata* Örsted, 1843
− Parapodia of mid-body with 2 postsetal lobes ····3
3. Probocidal papillae with more than 3 ridges ····*G. dentribranchia* Lee, 1985
− Probocidal papillae with up to 3 ridges ····4
4. Notopodial postsetal lobe longer than neuropodial one in mid-body ····5
− Notopodial and neuropodial postsetal lobes nearly equal in length in mid-body ····6
5. Branchiae 1-6 retractile and digitiform rami ····*G. macintoshi* Grube, 1877 (*G. subaenea* Grube, 1878)
− Branchiae simple, retractile, and digitiform ramus ····*G. nicobarica* Grube, 1868 (*G. chirori* Izuka, 1912 and *G. decipiens* Marenzeller, 1879)
6. Postsetal lobes on mid-body blunt and more or less rounded; parapodia with simply blister-like branchiae ····*G. fallax* Quatrefages, 1850
− Postsetal lobes on mid-body slender and triangular-shaped; parapodia with one or two digitform branchiae ····*G. unicornis* Lamarck, 1818 (*G. rouxii* Audouin and Milne Edwards, 1833)
7. Parapodia without branchiae ····*G. onomichiensis* Izuka, 1912
− Parapodia with branchiae ····8
8. Probocidal papillae with long stalk ····*G. alba* (Müller, 1776)
− Probocidal papillae with short stalk ····*G. tridactyla* Schmarda, 1861 (*G. convoluta* Keferstein, 1862)

ACKNOWLEDGEMENT

This work was supported by the Research funds from Chosun University (2015) and the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR NO. 2014-02-001).

REFERENCES

Berkeley E and C Berkeley. 1941. On a collection of Polychaeta from southern California. Bull. South. Calif. Acad. Sci. 40:16-60.

Böggemann M. 2002. Revision of the Glyceridae Grube, 1850 (Annelida: Polychaeta). Abh. Senckenberg. Naturforsch. Ges. 555:1-249.

Böggemann M. 2009. Polychaetes (Annelida) of the abyssal SE Atlantic. Org. Divers. Evol. 9:252-428.

Böggemann M, C Bienhold and SM Gaudron. 2012. A new species of Glyceridae (Annelida: Polychaeta) recovered from organic substrate experiments at cold seeps in the Eastern Mediterranean Sea. Mar. Biodiv. 42:47-54.

Day JH. 1967. A monograph on the Polychaeta of Southeren Africa. Trust. Brit. Mus. (Nat. Hist.), London.

Fauchald K. 1977. The polychaete worms, definitions and keys to the orders, families and genera. Natn. Mus. Hist. L. A. Sci. ser. 28, Los Angeles.

Fauchald K and PA Jumars. 1979. The diet of worms: a study of polychaete feeding guilds. Oceanogr. Mar. Biol. Ann. Rev. 17:193-284.

Fauvel P. 1923. Polychètes errantes. Faune de France, Lechevalier, Paris.

Hartman O. 1950. Goniadidae, Glyceridae and Nephtyidae. Allan Hancock Pac. Exped. 15:1-181.

Hilbig B. 1997. Family Glyceridae Grube, 1850. pp. 187-202. In Taxonomic atlas of the benthic fauna of the Santa Maria Basin and western Santa Barbara (Blake JA, B Hilbig and PV Scott eds.). Santa Barbara Museum of Natural History, Santa Barbara, California.

Imajima M and O Hartman. 1964. The polychaetous annelids of Japan, Part II. Allan Hancock Found. Occas. Pap. 26:239-452.

Imajima M. 2003. Polychaetous annelids from Sagami Bay and Sagami Sea collected by the Emperor Showa of Japan and deposited at the Showa Memorial Institute. Nat. Sci. Mus. Monogr. 23:1-221.

Imajima M. 2009. Deep-sea benthic polychaetes off Pacific Coast of the Northern Honshu, Japan. Nat. Mus. Natur. Sci. Monogr. 39:39-192.

Lee JH. 1984. Polychaetous annelids from the Yellow Sea II. Family Glyceridae. Bull. Korea Ocean Res. Dev. Inst. 6:13-19.

Magalhaes WF and AE Rizzo. 2012. Glyceridae (Annelida: Polychaeta) from Guam, Mariana Islands with description of a new species of *Glycera* Savigny in Lamarck, 1818. Zootaxa 3338:60-68.

Paik EI. 1975. The polychaetous annelids in Korea (III). Res. Bull. Hyosung Women's Coll. 17:409-438.

Paik EI. 1978. Preliminary survey of the polychaetous annelids from Gogeum Island, Korea. Res. Bull. Hyosung Women's Coll. 20:1-25.

Paik EI. 1982. Taxonomic studies on polychaetous annelids in Korea. Res. Bull. Hyosung Women's Coll. 24:745-913.

Paik EI. 1989. Illustrated encyclopedia of fauna and flora of Korea. Vol. 32. Polychaeta. Ministry of Education Press, Seoul.

Quatrefages AD. 1850. Etudes sur les types inferieurs de l'embranchement des anneles. Memoires su la system nerveux des annelides. Annal. Sci. Natur. 3:329-398.

Rho BJ and KH Song. 1974. A study on the classification of the Korean Polychaeta (I). Jous. Kor. Res. Inst. Bet. Liv. 12:73-85.

Rho BJ and KH Song. 1975. On the classification and the distribution of the marine benthic animals in Korea: 2. Polychaetous annelids. Jous. Kor. Res. Inst. Bet. Liv. 14:95-118.

Rizzo AE, TM Steiner and ACZ Amaral. 2007. Glyceridae Grube, 1850 (Annelida: Polychaeta) from Southern and Southeastern Brazil, including a new species of *Glycera*. Biota neotrop. 7:41-59.

Received: 18 August 2015
Revised: 15 September 2015
Revision accepted: 15 September 2015