

Reproductive Anatomy of Genus *Juga* (Gastropoda: Cerithioidea: Pleuroceridae) from South Korea

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한국산 *Juga* 속 (Gastropoda: Cerithioidea: Pleuroceridae)의 생식기 해부형태

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ABSTRACT

The reproductive system of freshwater egg-lying mollusks from a stream of South Korea was examined using histological methods. The pallial oviduct of two oviparous species of Pleuroceridae in South Korea was similar to that of the *Juga* species in Russian Far East. This study also revealed some anatomical inter-specific differences.

Key words : Reproductive system, Pleuroceridae, *Juga*, *Juga tegulata*, Anatomy

INTRODUCTION

Previously the South Korean species of Pleuroceridae were grouped in the subgenus *Hua* and the genus *Juga* (Starobogatov 1970; Bogatov & Zatravkin 1990). However, the anatomy of *Melania telonaria* Heude, 1888- the type species of genus *Hua* described from Yangtze River drainage (Chen 1943), is still unknown. As the Yangtze River drainage has high level of faunal endemism (Prozorova & Wu 2004; Prozorova *et al.* 2005), we suspected that *Hua* is endemic in this drainage. We examined the anatomy of two species of Pleuroceridae from South Korea as representatives of the genus *Juga*. According to the morphometric data by Martens (Martens 1905), these species are *Juga tegulata* and *Juga* sp. The structures of female reproductive system of these two species were described for the first time.

MATERIALS AND METHODS

Specimens of two species of Pleuroceridae which were iden-

tified as *Juga tegulata* and *Juga* sp. in the present paper were sampled in a stream in South Korea (Chungcheongnam-do, Kongju, Mt. Kyeryong), and the samples were preserved in 100% ethanol. The pallial portion of reproductive system was dissected to examine the morphology and structure of the pallial genital duct. The histological sections of different parts of oviduct were prepared at 5-7 μ and stained with hematoxylin and eosin to examine under light microscope.

RESULTS AND DISCUSSION

The pallial oviduct of the specimen of the genus *Juga* was similar to that of other Pleuroceridae species (Prozorova 1990; Rasshepkina 2007; Strong & Frest 2007; Strong & Kohler 2009), and characterized by medial and lateral laminae with inter lamellar cavity between them. The inter lamellar cavity was widely opened into mantle cavity and close proximally only (Figs. 1, 2). The lateral lamina included glandular tissues and consisted of albumen and nidamental glands. The albumen gland cells were stained pink with eosin and consequently product albumen secretion. Cells of nidamental gland were stained lavender color with hematoxylin because the mucus

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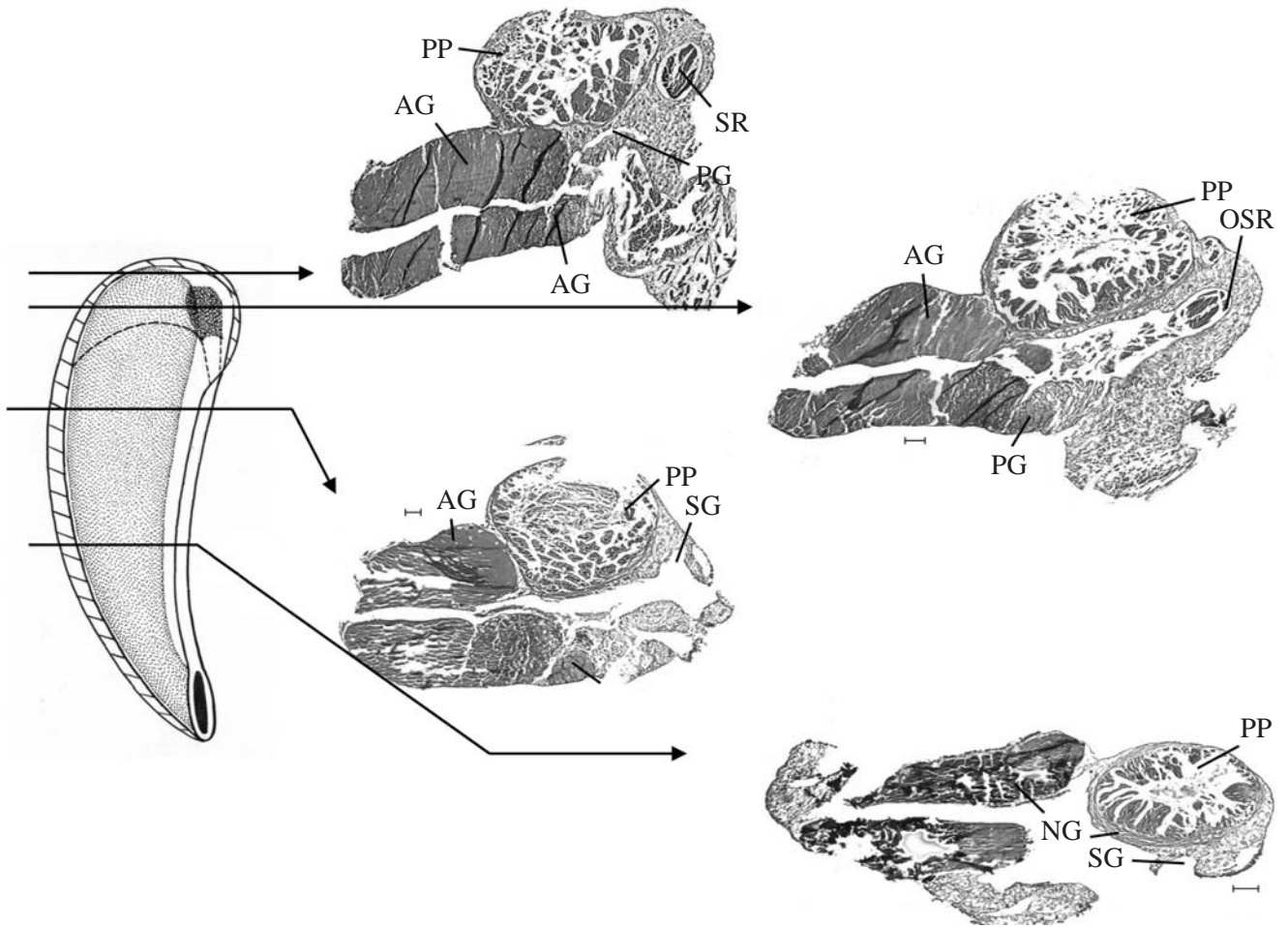


Fig. 1. The pallial oviduct scheme of *Juga tegulata* from South Korea. AG, albumen gland; NG, nidamental gland; OSR, opening seminal receptacle; PG, pararenal gland; PP, pallial semen-accepting pocket; SG, sperm gutter; SR, semen receptacle. Scale bar=100 μ .

around eggs. Besides theirs in proximal part of the lamina, we found a small pararenal gland. The cells stained lavender color were differentiated from the pink albumen gland cells (Figs. 1, 2). We suspect that the secretion of pararenal gland is required for covering eggs or taking part in insemination, because pararenal cells only occurred near the seminal receptacle.

The medial lamina consisted of seminal receptacle and semen-accepting pallial pocket, and both parts were covered with connective tissues. We recognized that the first structural organ was filled with oriented spermatozoa along the fall (spermatozoa heads were small because they were haploid and stained with hematoxylin clearly).

Both species had structurally similar pallial pocket which was characterized by the tube containing disintegrated spermatozoa. Muscle walls were around distal triens of this organ. Pallial pocket was adjacent to lateral lamina glands. There was a connective tissue layer of 2-3 cells between pallial pocket

and lateral lamina glands.

Along the external side of pallial pocket, there was a sperm gutter toward the seminal receptacle. The seminal receptacles of both species *Juga* sp. and *J. tegulata* were oval and located under the left side of pallial pocket, close to inner part of medial lamina (Figs. 1, 2). Both species had an opening of seminal receptacle close to the part of inter lamellar cavity.

Some inter-specific differences were found in the position of the seminal receptacles. This organ of *J. tegulata* was disposed on the level of pallial pocket (Fig. 1), while the oviduct seminal receptacle of *Juga* sp. was located above the pallial pocket (Fig. 2). We believe that the revealed differences in location of seminal receptacle were enough to separate *Juga* sp. from *J. tegulata* at the species level. The results from this anatomical study suggest that these Pleureridae species from Korean peninsula were similar to the *Juga* species in Russian Far East.

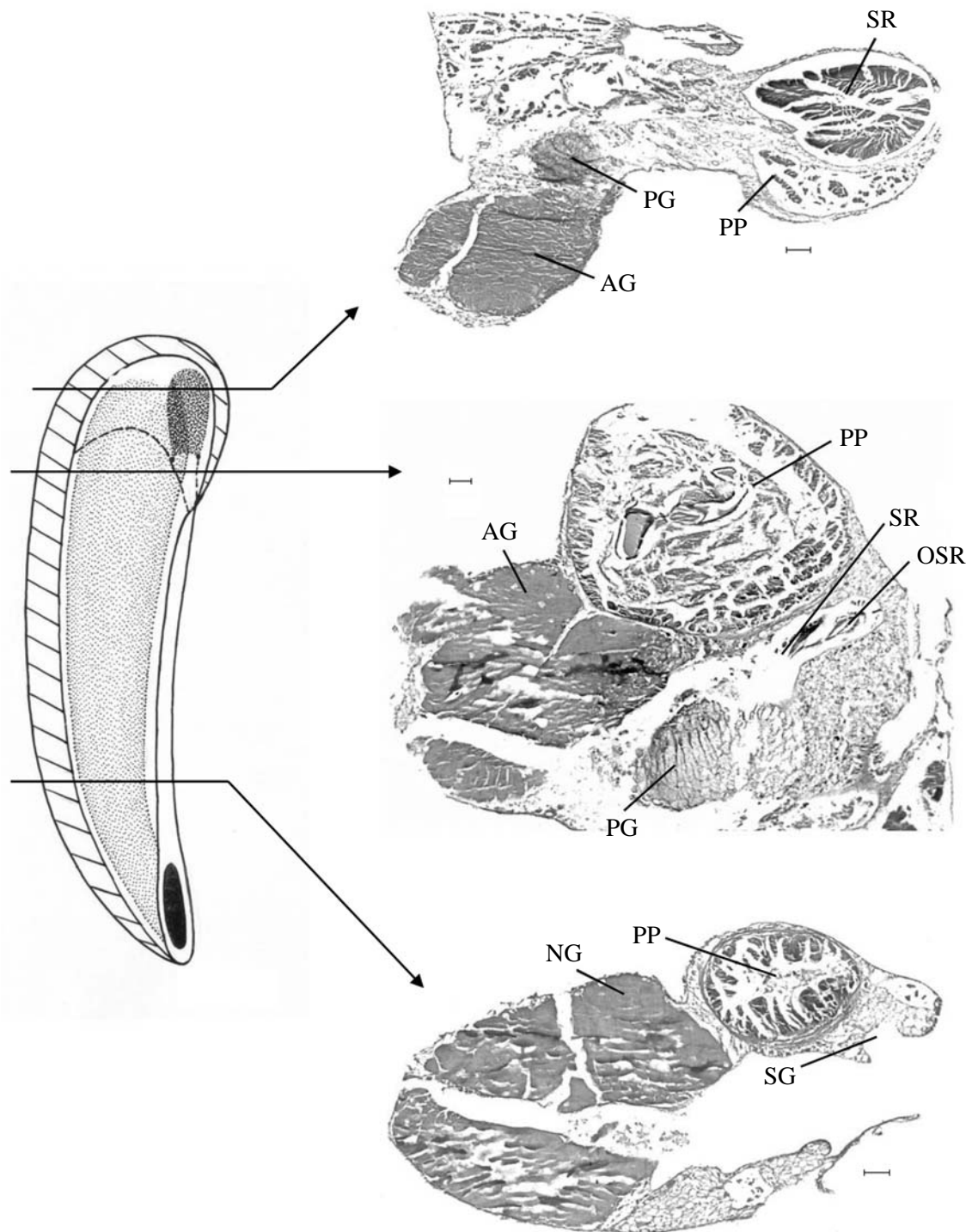


Fig. 2. The pallial oviduct scheme of *Juga* sp. from South Korea. Abbreviations: see Fig. 1. Scale bar=100 μ.

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Reproductive Anatomy of Genus *Juga* (Gastropoda)

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