

[단보, Short communication]

Report on the new habitat of *Clithon retropictum* (v. Martens, 1870) in a small estuary on the northern Jeju Island

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ABSTRACT

The neritid *Clithon retropictum* (v. Martens, 1870) is listed as a second-grade endangered mollusk species in Korea, inhabiting river mouths and estuaries on the south coast and Jeju Island. *C. retropictum* has been identified from four localities on Jeju Island, two on the north and the other two on the south coasts. Recent surveys on the northern coast of Jeju Island indicated that a small population of *C. retropictum* inhabits the river mouth of Gosung-Cheon stream located near Hagwi fishing port on the northern Jeju Island. In the newly found locality, we identify several adult sizes of *C. retropictum* and the numerous egg capsules attached to rocks. Accordingly, we report the new habitat of the estuarine gastropod on the northern coast of Jeju Island.

Key Words: *Clithon retropictum*, habitat, Jeju Island, egg capsules

INTRODUCTION

The neritid *Clithon retropictum* (v. Martens, 1870)(= *C. retropictus*) is a brackish water gastropod found in estuaries and rivers, ranging from Korea and Japan to Taiwan (Habe, 1961; Komatsu, 1986; Burch *et al.*, 1987, Chung, 2003). Recently, the world registered marine species database (WoRMS, 2020) has changed the species name from “*C. retropictus*” to “*C. retropictum*”. Currently, *C. retropictum* is listed as a second-grade endangered mollusk species in Korea due to its small population size and habitat vulnerability. In Jeju Island, *C. retropictum* has been identified from small estuarine habitats such as downstream areas extending from freshwater to the upper intertidal areas (Noseworthy *et al.*, 2012, 2013).

To locate *C. retropictum* habitat in Jeju Island, we surveyed several small river mouths located on the northern Jeju Island. This study reports a new locality of *C. retropictum* near Jeju City, with a habitat description.

DESCRIPTION OF THE NEW LOCALITY

In the fall of 2018, the initial survey resulted in two dead adult specimens of *C. retropictum* being obtained from a beach near the New Hagwi port (Fig. 1), representing a new locality for this species in Jeju Island. As those specimens were obtained from the beginning of the estuary, it was surmised that this could be the origin of those specimens. In April 2020, a further survey resulted in *C. retropictum* being found living under slightly silt-covered rocks and small boulders in shallow water; six live specimens were identified. In May 2021, we revisited the new locality and identified several adults and the egg capsules (Fig. 2), suggesting that this species had been established there for some time.

We measured the sizes of the adults, which ranged from length 1.0 to 2.0 cm to width 0.8 to 1.5 cm, the

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Clithon retropictum new habitat in Jeju Island

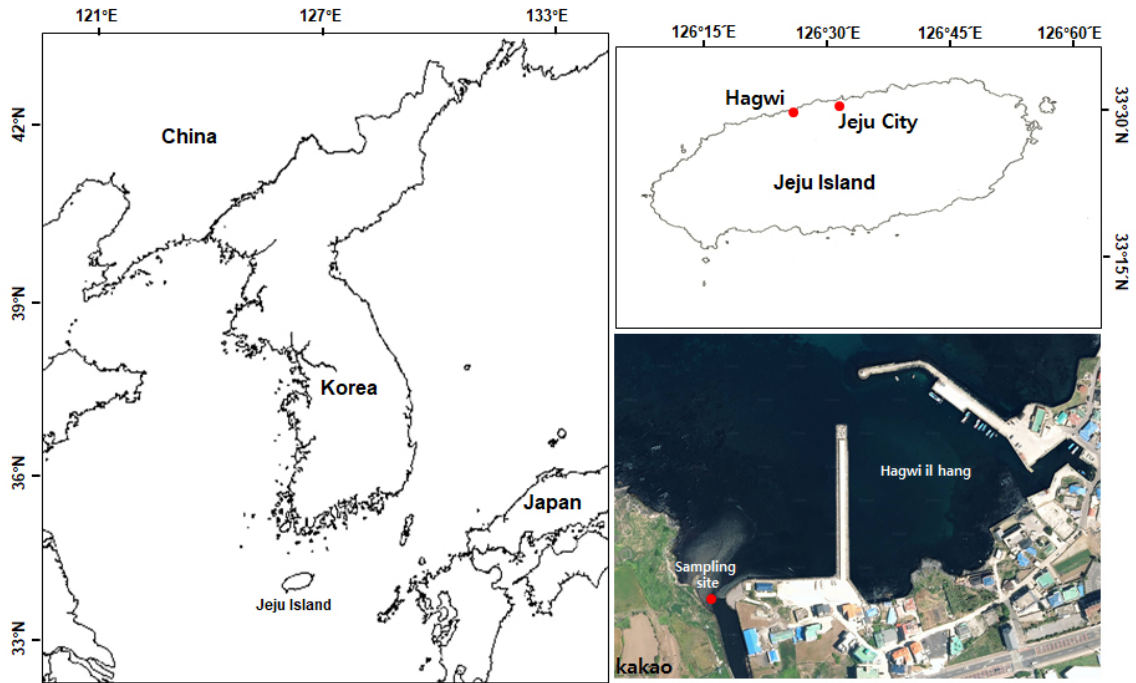


Fig. 1. New locality of *C. retropictum* in a small estuary near the new Hagwi port.



Fig. 2. A, B, Gosung-Cheon stream by the new Hagwi port. C, D, Adult *C. retropictum* and their egg capsules.

specimens being smaller and slightly more elongated than specimens from the other Jeju localities. An examination of growth lines to determine age (Shigemiya and Kato, 2001) revealed that the specimens were between 1 and 2 years, similar to the Hwabuk specimens collected in 2013. As found in the other populations surveyed, the amount of shell erosion correlated with age. The overall color of the shell varies with the thickness of the periostracum, which determines the darker or lighter shadings (Noseworthy *et al.*, 2012). The color of the Hagwi specimens was generally dark olive, the same as the Hwabuk specimens, except for one specimen exhibiting a greyish-olive color.

In Korea, *C. retropictum* has been reported from the south coast and in Jeju Island (Noseworthy *et al.*, 2013). *C. retropictum* occupies somewhat restricted habitats in Korea; however, larger populations occur in Japan (Miyajima and Wada, 2014; Kobayashi and Iwasaki 2002). *C. retropictum* is one of the longest-lived freshwater gastropods, with a lifespan up to 12 years (Choi *et al.*, 2018). In mainland Korea, the populations of this species are gradually decreasing due to increased habitat destruction and environmental quality degradation (Oh and Kim, 2018). *Clithon retropictum* has been listed by the Ministry of Environment as an endangered species since 1998 (Choi *et al.*, 2018). The formal designation for this species is “VU Ai(ac) and B2ab(iii)”, VU meaning “vulnerable”.

In Jeju Island, *C. retropictum* inhabits clean water on stones, and small boulders, usually covered with a thin film of silt or algae, and Table 1 summarizes the localities where the gastropods were identified. The

Hwabuk population inhabited the undersides of rocks in wet mud (Noseworthy *et al.*, 2012; 2013). As mentioned above, the small stream at Hwabuk experiences periods of low water flow, and this habitat may reflect an adaptation to dry conditions, where the mud provides much-needed moisture. In Japan, this species has been found to feed on epilithic microalgae on the surface of rocks (Miyajima and Wada, 2014); thus, the films of silt and algae on rocks in the Jeju localities may contain this food source. A change in water quality may adversely affect the viability of the Jeju populations. Furthermore, a change in salinity may also be detrimental to *C. retropictum*. After spawning, the veliger larvae drift downstream, returning to the mouths of rivers as pediveligers (Kobayashi and Iwasaki, 2002). This species has a high tolerance to salinity, but the size of individuals tends to decrease with increased salinity (Lee *et al.*, 2018). This suggests that the juvenile *Clithon* first inhabit the lower reaches of the rivers where the salinity is highest before moving upstream. An increase in water flow may severely limit the area where the juveniles are developing, adversely affecting the viability of the population. Accordingly, further field studies to map the occurrence and ecology of this species would be of extreme importance to fully safeguard its existence in vulnerable habitats.

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Table 1. Localities of *C. retropictum* habitats in Jeju Island

Location	Latitude	Longitude	Remarks
Gang-Jeong	33°13'34.72" N	126°28'23.21" E	Southern Jeju Island
Yae-Re-dong	33°14'31.22" N	126°23'44.71" E	Southern Jeju Island
Ong-Poe-Cheon, Hallim	33°24'27.89" N	126°15'24.58" E	Northern Jeju Island
Hwa-Buk	33°31'21.64" N	126°33'35.19" E	Northern Jeju Island
Ha-Gwi Gosung-Cheon	33°29'05.38" N	126°24'17.54" E	Northern Jeju Island

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