First record of the little-known land gastropod genus Nobuea Kuroda et Miyanaga, 1943 (Gastropoda Diplommatinidae) from Jeju Island, South Korea

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ABSTRACT Nobuea Kuroda et Miyanaga, 1943 (Gastropoda Cyclophoridae) is one of the least-known genera of terrestrial gastropods. An individual of this genus was collected from Jeju Island, South Korea, the first record of Nobuea from this island. Further studies are needed to investigate the taxonomic and conservation status of the Jeju Nobuea reported here.

KEY WORDS Conservation; nonmarine gastropods; insular biodiversity; new records; geographic distribution.

INTRODUCTION

The genus Nobuea Kuroda et Miyanaga, 1943 (Gastropoda Diplommatidae) represents one of the least-known genera of land gastropods. There are two recognized species of this genus: N. elegantistriata Kuroda et Miyanaga, 1943 and N. kurodai Minato et Tada, 1978.

The first species was described based on a single specimen collected on Geomun Island, South Jeolla Province, South Korea (Kuroda & Miyanaga, 1943) and no living individual has been encountered at least for the last three decades (National Institute of Biological Resources, South Korea, 2012). In the Korean literature, few illustrations of N. elegantistriata occur, e.g., Kwon et al., (1993; 2001), Min et al., (2004) and Lee & Min (2005). The illustration in Kwon et al., (2001) is repeated in the two subsequent publications. Nobuea kurodai was recorded from Tushima-cho, Ehime Prefecture, Japan (Minato & Tada, 1978) and, subsequently, an additional population was found on Mt. Kamon, Miyazaki Prefecture, Japan (Minato & Nishi, 1996).

At present, as far as we know, only five individuals of this species have been reported (four from the type locality and one from the second population). Because of the low population densities and/or restricted distributions, both Nobuea species are listed in national level red data books (National Institute of Biological Resources, South Korea, 2014; Ministry of Environment, Japan, 2019).

Jeju Island is the largest island in South Korea, with an area of about 1800 km², and is situated about 80 km south of the Korean peninsula. The non-marine gastropod fauna of this island has been relatively well examined (e.g., Habe & Kosuge, 1970; Noseworthy et al., 2007). At present, 52 species of land snails and eight freshwater snails have been recorded from Jeju Island (Habe & Kosuge, 1970; Joo et al., 1979; Noseworthy et al., 2007; Kimura et al., in press).
MATERIAL AND METHODS

On 10 October 2018, a field survey was conducted, and a single specimen of the genus *Nobuea* was collected at the parking lot of Geolmae Eco Park, Seogwipo, Jeju Special Self-governing Province (33°14’53.9”N 126°33’15.1”E) (Fig. 1). Its shell was examined under a light microscope. Because the specimen was preserved in 100% ethanol soon after being collected, the details of its anatomy were not obtained. The examined specimen was deposited in the personal collections of K. Kimura (Voucher No: MNKS2551).

RESULTS AND DISCUSSION

Systematics

Phylum MOLLUSCA Cuvier, 1797

Classis GASTROPODA Cuvier, 1795
Subclassis CAENOGASTROPODA Cox, 1960
Ordo ARCHITAENIOGLOSSA Haller, 1890
Superfamilia CYCLOPHOROIDEA Gray, 1847
Familia DIPLOMATINIDAE Pfeiffer, 1857
Genus *Nobuea* Kuroda et Miyanaga, 1943

*Nobuea* sp.

**DESCRIPTION.** Shell small, strongly depressed, thin, rather dull white. Measurements: height 1.8 mm, width 4.0 mm (Fig. 2, Voucher No: MNKS2551). Whorls three, with regularly increasing diameter. Protoconch with 1½ whorls, with smooth, glossy surface. Teleoconch finely rib-striated at irregular intervals, lower whorls more densely than upper ones. Ribs not parallel; spiral striae absent. Aperture circular, slightly oblique. Periphery round. Suture deep. Umbilicus wide and

![Figure 1. Sample collection locality in Jeju Island, South Korea.](image-url)
First record of the little-known land gastropod genus Nobaea from Jeju Island, South Korea

DISTRIBUTION AND BIOLOGY. The genus Nobaea is known from two Korean islands (Geomun and Jeju Islands) and western Japan (Ehime and Miyazaki Prefectures). There is few information on the ecology and life history of this genus.

REMARKS. The specimen examined here was probably an immature individual, and therefore adult shell size, shape, and anatomy of mature individuals remain to be elucidated. However, the specimen exhibited distinct differences from the two other Nobaea species. The Jeju Nobaea has a flatter shell, with fewer and more prominent ribs on its shell surface than found in N. elegantistriata and Nobaea kurodai. In addition, the Jeju Nobaea can be distinguished from N. elegantistriata by its larger shell size. Further studies using additional adult specimens are needed to confirm the taxonomic status of this Nobaea. It should be noted that the taxonomic position of the genus Nobaea is still controversial (Kwon et al., 1993; Azuma, 1995; Minato & Nishi, 1996). Although the original description by Kuroda & Miyanaga (1943) places N. elegantistriata in Diplommatinidae, Kwon et al., (1993) include it in the Alycaeidae. Subsequently, Minato & Nishi (1996) and more recent publications regard the genus Nobaea as a member of the Cyclophoridae. In this study, we placed the genus in Diplommatinidae in accordance with Kuroda & Miyanaga (1943).

ACKNOWLEDGEMENTS

We express our sincere gratitude to Joy Noseworthy for considerable assistance in the field survey, and Daishi Yamazaki for providing the information on Japanese Nobaea. This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2016R 1 A6A1A050119 10).

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