Cretaceous Research 89 (2018) 224–234

Contents lists available at ScienceDirect

Cretaceous Research

journal homepage: www.elsevier.com/locate/CretRes

Aptian ammonite fauna from the Yezo Group of the Urakawa area in Hokkaido, Japan

Masao Futakami

Paleontological Laboratory, Kawamura Gakuen Woman's University, 1133 Sageto, Abiko-shi, Chiba-ken, 270-1138, Japan

ARTICLE INFO

Article history:
Received 21 November 2017
Received in revised form
13 February 2018
Accepted in revised form 25 March 2018
Available online 27 March 2018

Keywords:
Colombiceras
Rhytidoplites
Cheloniceras
Yezo Group
Aptian
Lower Cretaceous

ABSTRACT

Three Aptian acanthoplitin and cheloniceratin ammonites, *Colombiceras spathi* Humphrey, 1949, *Rhytidoplites adkinsi* (Humphrey, 1949) n. comb., and *Cheloniceras* sp. from the Tsukenai Formation of the Yezo Group in the Urakawa area, southern Hokkaido, Japan, are described here systematically. The first 2 of these species were presently unknown from any regions except for Mexico; the second species, which has been provisionally assigned to *Gargasiceras* Casey, 1954 by mainly Mexican workers, can be placed within the genus *Rhytidoplites* Scott, 1940, on the basis of the mode of ribbing. The detailed geological age of the Tsukenai Formation is assigned to the late early–early late Aptian, based on the occurrences of two ammonites in Mexico, indicating a lower age limit for the Yezo Group. The Aptian ammonite fauna in Hokkaido consists dominantly of ammonites of the subfamily Acanthoplitinae, with the subfamily Cheloniceratinae and others subordinate, and shows rather a low diversity in its specific composition and a high similarity with that of Mexico.

1. Introduction

In 1994, fossiliferous strata containing abundant Aptian ammonites were discovered by Y. Kawashita at a small outcrop near the Urakawa Dam, which was under construction by the Hokkaido Regional Development Bureau. Shortly afterward, a geological investigation of the outcrop was undertaken, together with Y. K., T. Shimanuki, and M. Okada. The strata at the exposure were correlated lithologically with the Tsukenai Formation, the lowest part of the Yezo Group, and more than fifty specimens of molluscan fossils, including ammonoid and gastropods were collected from them. This outcrop has been unfortunately lost due to the completion of the Urakawa Dam, disappearing beneath the reservoir water.

Most of ammonites obtained at the fossil site are identified as *Colombiceras spathi* Humphrey, 1949 and *Rhytidoplites adkinsi* (Humphrey, 1949) n. comb., belonging to the Subfamily Acanthoplitinae Stoyanow (1949). These taxa have been hitherto unknown from any regions outside of Mexico (e.g. Humphrey, 1949; Ovando-Figueroa et al., 2015; Barragán et al., 2016), where, in addition to the systematic description of acanthoplitin ammonites, including these two species, their stratigraphic ranges have been analyzed in detail, and consequently some refinements of the regional ammonite zonation of the lower to upper Aptian have been proposed by some workers (Barragán-Manzo and Méndez-Franco, 2005; Moreno-Bedmar et al., 2013).

In the present work, the systematic description of these important ammonites as zonal markers of the Aptian from the Yezo Group of the Urakawa area of Japan is presented, with a discussion of their biostratigraphic significance.

2. Geological setting

The Lower Cretaceous marine deposits in Hokkaido, Japan have been assigned to the Sorachi Group, lithostratigraphic unit that ranges from Tithonian (Late Jurassic) to Barremian in age based on radiolarians (e.g. Kito, 1987; Takashima et al., 2001), and to the lower part of the Yezo Group, ranging from early Aptian to late Albian on the basis of planktonic foraminifers (e.g. Takashima et al., 2004). The occurrence of ammonites from the Sorachi Group is, however, very rare, with only three specimens provisionally referred to *Crioceras* (= *Crioceratites*) sp. known from Rebun Island on the Sea of Japan, the northernmost island of Japan (Akiba and Omori, 1959). Matsumoto (1964) subsequently identified these specimens as *Uhligia* sp. and *Pulchellia* (*Caicedea*) sp., and suggested that the upper part of the Sorachi Group reaches Barremian in age. In the Yezo Group succession, the Lower Cretaceous ammonites are

E-mail address: M.Futakami@kgwu.ac.jp.

https://doi.org/10.1016/j.cretres.2018.03.025
0195-6671/

relatively common from the Albian strata, including the zonal markers (e.g. Futakami, 1996; Futakami and Haggart, 2018), whereas Aptian ammonites are extremely rare, with only a single specimen of *Parahoplites colossus* Matsumoto (1984) from Nakagawa, northern Hokkaido reported so far.

In the Urakawa area (Fig. 1), the Sorachi Group is represented by the Nitarachi Formation, which correlates with the upper part of the group and was assigned to Valanginian in age by Kanie et al. (1981) based on the radiolarian assemblage. The lower part of the Yezo Group (Lower Cretaceous), conformably overlying the Nitarachi Formation of the Sorachi Group, is divided into two units, the Tsukenai and Becchari formations in stratigraphic order, which reach a total thickness of more than 330 m. The former is composed mainly of sandstone, while the latter consists of claystone and sandstone (Sakai and Kanie, 1986).

Highly fossiliferous strata crop out on the eastern side of the Urakawa Dam, situated on about 6 km upstream from the mouth of the Mukoubetsu River (Fig. 1), and are composed of dark grey sandy siltstone with bioturbation and enriched in plant fragments (Fig. 2). These strata correspond lithologically to the Tsukenai Formation, which represents the lowest formation of the Yezo Group. Molluscan fossils are obtained from a bed of about 20 cm in thickness, particularly concentrated in a horizon 1–2 cm-thick (Fig. 2B). In addition to the cheloniceratin and acanthoplitin ammonites described here, weakly ornamented ammonites such as *Hypohylloceras* sp., *Eogaudryceras* sp., *Melchiorites* sp., and *Pseudohaploceras* cf. *nipponicum* Shimizu, 1931 have been found in the strata, as illustrated in Fig. 3.

3. Systematic paleontology

Institutional abbreviations. The following abbreviations are used to indicate the repositories of specimens: NMNS, National Museum of Nature and Science, Tsukuba, Ibaraki; IGPS, Tohoku University Museum, Sendai, Miyagi.

Dimensions. All measurements are given in millimeters. The following abbreviations are used for morphological features: D, shell diameter; Wb, whorl breadth; Wh, whorl height; U, umbilical width; NR, number of ribs per whorl. Descriptive terminology is used in accordance with the definitions of Matsumoto (1988, p. 4–5).

Order Ammonoidea Zittel, 1884
Suborder Ancyloceratina Wiedmann, 1966
Superfamily Douvilleiceratoidea Parona and Bonarelli, 1897
Family Douvilleiceratidae Parona and Bonarelli, 1897
Subfamily Cheloniceratinae Spath, 1923

Genus *Cheloniceras* Hyatt, 1903
Type species. Ammonites cornuelianus Orbigny, 1841, p. 364.

Cheloniceras sp.
Figs. 4U, V, 5G–I

Material. Two specimens, NMNS PM35088 and NMNS PM35089 (M. Futakami Coll.) were obtained from dark grey sandy siltstone beds of the Tsukenai Formation, the lower part of the Yezo Group, from a

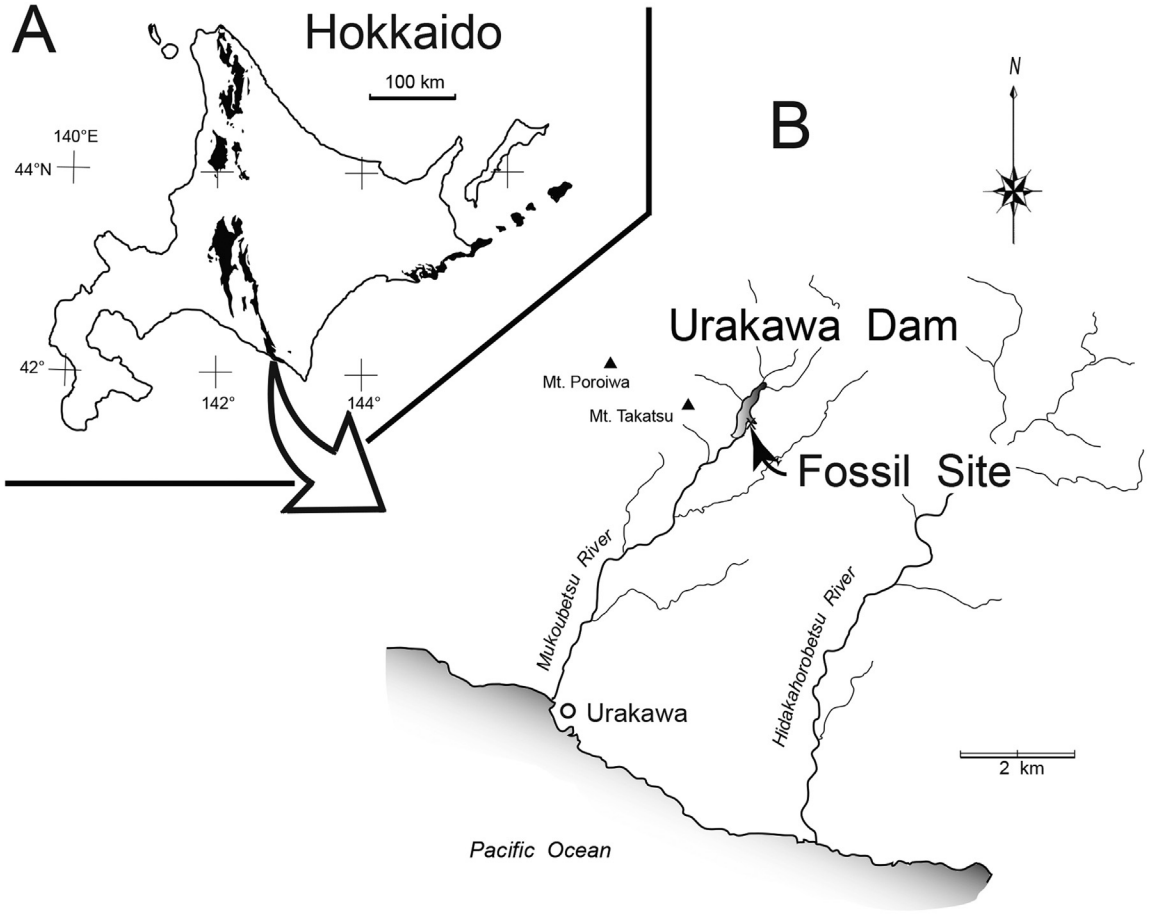

Fig. 1. Location map of the Urakawa area, southern Hokkaido, showing the Cretaceous marine deposits in Hokkaido (A) and the location of the fossil site (B).