THE AGE OF THE MIOCENE KAMISHIYUBETSU FORMATION IN NORTHERN HOKKAIDO AND THE BASINS FORMED BY TECTONIC MOVEMENT

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Introduction

The Kamishiyubetsu Formation (HASEGAWA & MATSUI, 1961) in northern Hokkaido consists mainly of conglomerates, unconformably overlying Mesozoic rocks. The conglomerates are so hard that they have been considered to be Mesozoic sediments. However, HASEGAWA & MATSUI (1961) discovered plant fossils from mudstone intercalated with the conglomerates in the Kamishiyubetsu region (Fig. 1). The plants were identified as *Mirica* (*Comptonia*) *naumanii* (NATHORST) and *Carix* sp., which suggest Middle Miocene in age. Based on these fossils, they distinguished the conglomerate predominating bed from Mesozoic rocks and named it "Kamishiyubetsu Formation" (HASEGAWA & MATSUI, 1961).

The Kamishiyubetsu Formation is distributed in the Okoppe-Shikaribetsu region (Fig. 1). The formation comprises an assemblage of several minor basins which are several kilometers wide and over ten kilometers long (Fig. 1). MIYASAKA *et al.* (1980) surveyed the Kitami-Takinoue region and correlated the formation with the Middle Miocene Chikubetsu Formation in the Haboro district, northern Hokkaido. We surveyed the formation in the Shikaribetsu region (Fig. 1), southern end of the formation, and discovered some microfossils. We shall report briefly the fossils and discuss the tectonics of the Hidaka Belt from these data.

Geologic Setting

Fig. 1 shows the geologic map of the Shikaribetsu region. The Kamishiyubetsu Formation is distributed in the N-S trending narrow

belts, and shows fault contact with Mesozoic rocks, so-called "Hidaka Supergroup" and Tertiary granite. This formation consists mainly of breccia, conglomerate, sandstone and mudstone. It is difficult to reconstruct an accurate geologic succession, because it was bitterly disturbed and dissected by faults and folds. WATANABE (in prep.) subdivided the formation into three units on the basis of its lithology; Km-A, breccia unit which consists mainly of granitic clasts, Km-B, conglomerate unit including mudstone in the lowest part, and Km-C, alternating beds of conglomerate, sandstone and mudstone. These three units are piled up in ascending order. We discovered some radiolarians, diatoms and benthonic foraminifers from the mudstone at the lowest part of the conglomerate unit (Km-B). The Kamishiyubetsu Formation is overlain by the Late Miocene Upepesanke Welded Tuff and Tokachi-Horoka Formation (YAMAGISHI & MATSUNAMI, 1976).

Fossils and the age of the Kamishiyubetsu Formation

Fig. 2 shows a route map of sampling localities of the Kamishiyubetsu Formation. Specimens of about one hundred or more radiolarian individuals were obtained from four localities (Fig. 2). Obtained radiolarians of each locality are shown in the following list (Table 1). These radiolarian fossils include common species with Middle Miocene *Cyrtocapsella tetrapera* - *Eocyrtidium inflatum* assemblage (NAKASEKO & SUGANO, 1973) (Fig. 3). From this fact the age of the Kamishiyubetsu Formation of the studied region is considered to be early Middle Miocene. The mudstone of locality D (Fig. 2) yielded benthonic foraminifers such as *Ammodiscus* sp., *Cyclammina japonica* ASANO, *C. ezoensis* ASANO, and *C. cancellata* BRADY. Judging from the

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Fig. 1 The distribution map of the Kamishiyubetsu Formation (Okoppe-Shikaribetsu region) and geologic map of the Shikaribetsu region. SWH: Southwestern Hokkaido. I.T: Ishikari-Teshio Belt. Km: Kamuikotan Metamorphic Belt. Hi: Hidaka Belt. Hm: Hidaka Metamorphic Belt. To: Tokoro Belt. Ne: Nemuro Belt.

occurrence of the benthonic foraminifers, the sedimentary environment of the mudstone was presumably somewhat deep. From these facts, the Kamishiyubetsu Formation of the Shikaribetsu region can be correlated with that of the Kamishiyubetsu and Kitami-Takinoue regions, but shows rather deeper environment compared with northern two regions.

Geological Significance

From the study of the composition of con-

glomerates, lateral change of sedimentary facies and thickness of the formation, and deformation structures along the Pishikachinai Fault, WATANABE (in prep.) concluded that the basin accumulating the Kamishiyubetsu Formation in the Shikaribetsu region was formed by the strike-slip movement along the N-S trending Pishikachinai Fault. The basin associated with such a N-S trending fault is also observed in the Kamishiyubetsu and Kitami-Takinoue regions. In the Kamishiyubetsu region, the basin accumulating the formation is

localities radiolarian species	A	B	C	D
<i>Cyrtocapsella tetrapera</i> HAECKEL	●	●	●	●
<i>Cyrtocapsella cornuta</i> HAECKEL	●	●	●	●
<i>Thecosphaera miocenica</i> NAKASEKO	●	●	●	●
<i>Collosphaera cf. pylona</i> REYNOLDS			●	●
<i>Xiphosphaera cf. circularis</i> (CLARK & CAMPBELL)			●	●

Table 1 Radiolarians obtained from the Kamishiyubetsu Formation in the Shikaribetsu region.

Fig. 2 Route map. A, B, C and D are sampling points.

associated with the Muka Thrust (KIMURA *et al.*, 1982), while in the Kitami-Takinoue region, it is associated with the Takinoue Fault (MIYASAKA *et al.*, 1980). As the age of the microfossils is roughly consistent with

Fig. 3 SEM photograph of a radiolarian fossil (*Cyrtocapsella tetrapera* HAECKEL)
Scale bar = 100 μ m

that of the Kamishiyubetsu region (HASEGAWA & MATSUI, 1961) and the Kitami-Takinoue region (MIYASAKA *et al.*, 1980), mentioned above, we infer the possibility that a series of basins of the Kamishiyubetsu Formation was formed by the same Middle Miocene tectonic event, which may have been strike-slip movement.

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〔地 名〕

Chikubetsu.....築別	Muka武華	Shikaribetsu然別
Haboro羽幌	Okoppe興部	Tokachi-Horoka十勝幌加
Kamishiyubetsu.....上支湧別	Penkenai.....ペンケナイ	Upepesankeウペペサンケ
Kitami-Takinoue北見滝の上	Pishikachinai.....ピシカチナイ	