

## Large-scale overturned structure of the Northern Chichibu belt in the Yanadani area, Western Shikoku, Japan

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### INTRODUCTION

The Jurassic accretionary complex of the Northern Chichibu Belt contains a large amount of greenstone as seamount fragments. It's expected that the seamounts collision and accretion has once structurally affected accretionally complex. Many geologic studies concluded that the Northern Chichibu belt is gentle imbricate structure characterized by thrust, duplex, and synclorium. However, they rarely include description of the primary sedimentary structures. In this study, primary sedimentary structure and geological structure in Yanadani area, western Shikoku have been investigated in detail and the geological structure and formational process of the Northern Chichibu belt was discussed.

### GEOLOGICAL SETTING AND LARGE SCALE REVERSED STRUCTURE

This area is divided into two units of northern Unit 1 and southern Unit 2 based on constituent rocks and geological structure. In Unit 1, the beddings and cleavages generally dip northward and the stratigraphy is overturned. On the other hand, the beddings and cleavages of Unit 2 dip northward and the stratigraphy is normal. Unit 2 underlies Unit 1 with a northward dipping thrust. Both units have received the prehnite-pumpellyite facies metamorphism.

Unit 1: Unit 1 is divided into two subunits of northern Subunit 1-1 and southern Subunit 1-2 based on constituent rocks. Subunit 1-1 is characterized by pelitic m&eacute;lange containing various blocks of greenstones, chert, limestone, sandstone and coherent sequence. Subunit 1-1 includes the concentration range of greenstones blocks in the southward. The greenstones comprise intrusive dyke, pillow lava and volcanoclastic rock. Subunit 1-2 is in fault contact with Unit 2 and is coherent sequence contains breccia, conglomerate, sandstone and sandstone-mudstone alternation. The conglomerate contains pelagic and terrigenous rubbles and pebbles such as greenstones, limestone, chert, sandstone, and mudstone rip-up clast.

Unit 2: Unit 2 consists of pelitic m&eacute;lange including large blocks of greenstone-limestone complex. Limestone conformably lies on the basaltic pillow lava. The greenstones comprise mainly of pillow lava and a small amount of volcanoclastic rock.

### SEDIMENTARY STRUCTURES

The sedimental and deformation structures were described at not only sandstone-shale alternation and basaltic pillow lava but bedded chert and siliceous shale alternating with thin volcanic sandstone and shale by the description at outcrops, sampling and thin sections. Up-direction of the coherent sequences in each units is determined by graded bedding and cross-bedding. Transgression with coarser grained facies grading into more shaly facies are observable at 37 outcrops; 30 outcrops of alternating beds of sandstone and shale, 7 outcrops of bedded chert and siliceous shale alternating with volcanoclastic rocks.

In the southern part of Unit 1, the beddings and cleavages dip gently northward but the stratigraphy is overturned. In the northern part of Unit 1, they are steeply northward or vertical and their up-direction is southward. In contrast, the stratigraphy of Unit 2 is normal.

### DISCUSSION

Considering with seamount collision, these geological relationship suggest following; 1, after Unit 1 accretion, Unit 1 has been shortening, uplifted and turned to the trench ward and the up-direction has been southward by the strong lateral stress of seamount collision. 2, the seamount has subducted gradually, the frontal part of accretionary complex has been affected more strongly and dragged into the subduction zone along with the seamount. As a result the southern part of Unit 1 has overturned. 3, the seamount has underplated beneath the accretionary complex. There might be a large overturned and recumbent anticline at northward over this study area.