

Geology of the area of 1:200,000 quadrangle geological map of the Matsuyama district

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The Matsuyama district, located in the northwestern part of Shikoku Island and western part of the Seto Inland Sea, geologically comprise various rock types from Paleozoic to Quaternary in age.

The following Paleozoic units are distributed in the district, 1) Late Cambrian ultramafic rocks, 2) Late Devonian to Early Silurian plutonic-metamorphic complex, 3) Silurian to Devonian Okanaro Formation, 4) Early Permian high-pressure metamorphic complex, 5) Permian accretionary complexes.

Mesozoic units on the north side of the Median Tectonic Line (MTL) are 1) Cretaceous Ryoke Pluton-metamorphic Complex, and 2) Upper Cretaceous Izumi Group. Mesozoic units on the south side of the MTL are 1) Late Triassic to Early Jurassic high-pressure metamorphic complex, 2) Early to Middle Jurassic accretionary complex in the north Chichibu belt (Yusugawa, Sumiizuku, and Kamiyoshida units), 3) Middle Jurassic to Early Cretaceous accretionary complex in the south Chichibu belt (Ohirayama, Togano, Shirahigeyama, and Sanbosan units), 4) Early Cretaceous accretionary complex in the Shimanto belt, 5) Early Cretaceous high-temperature metamorphic complex, 6) Cretaceous Sanbagawa Metamorphic Complex (Iyo, Uchiko, Ozu, Hijikawa, and Mikabu units and Karasaki Mylonite), 7) Triassic shallow marine sediments, and 8) Jurassic shallow marine sediments, 9) Cretaceous shallow marine sediments (Nankai, Monobegawa, and Sotoizumi Groups).

The Jurassic to Early Cretaceous accretionary complexes tectonically underlie the mentioned-above Paleozoic units and early Mesozoic high-pressure metamorphic complex. The age of each Mesozoic accretionary complex becomes younger towards the apparent lower structural levels.

Neogene System in this area is divided into the Kuma and Ishizuchi Groups. The Kuma Group consists of three stratigraphic units of the Hiwadatoge (shallow marine calcareous sandstone), Furuiwaya (talus breccia) and Myojin Formations (conglomerate and lacustrine sediments) in ascending order. The Ishizuchi Group, horizontally overlies the Kuma Group unconformably, is composed of the Takano (tuff) and Kuromoritoge (welded tuff and andesite lava) Formations. These clastic and volcanoclastic sediments are intruded by a large number of andesitic to rhyolitic dykes and stocks.

The Setouchi-volcanic rocks in this area are olivine andesite, pyroxene hornblende andesite and biotite dacite. The reported radiometric ages of these rocks range from 16 Ma to 12 Ma, and most of them concentrate between 15.5 Ma and 14 Ma. The Gogoshima formation and the Takahama formation are composed of volcano-clastic rocks and volcanic rocks, which is similar to the Setouchi-volcanic rocks.

The early to middle Pleistocene fluvial sediments such as the Gunchu, Tomisuyama, Yakura, Torinoko and Iyoki Formations are exposed in the Matsuyama plain and in the middle to upper area of the Hiji River. The terrace deposits and Holocene sediments are distributed in and around the Matsuyama plain and sporadically along many rivers.

In the Matsuyama Plain, many E-W trending active faults are developed. These are called the Median Tectonic Line fault. This fault system extends to the Iyonada of the Seto Inland Sea.

In this area, two of mineralization belts are running to east and west. One is a Bedded Deposits of Cupriferous Pyrite in the Sanbagawa metamorphic complex, and another is bedded manganese ore deposit in the Jurassic accretionary complex in the southern Chichibu belt.

Large horizontal gradient zone of the Bouguer anomalies (assumed density 2.59 g/cm³) shown in central region corresponds to northern edge of the MTL. Northwestern part of the MTL shows negative anomalies and minimum value is approximately - 50 mgal near Iyo-nada in the Seto Inland Sea. Southeastern part of the MTL shows a mix of negative and positive anomalies in the middle and the other region, respectively. It is noted that small high anomalies correspond to areas of the Mikabu unit.

Keywords: Matsuyama, Geological map, gravity, active fault, mineral resource