Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)

SGL43-01 Room:411 Time:May 1 14:15-14:30

Tectonic evolution of Karwar and Coorg blocks, southern India

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The Karwar and Coorg blocks in western India are important terranes in the point of paleogeographic study of India and Madagascar. The *c.* 1300 Ma Kumta suture separates the Karwar and Dharwar blocks within the western Dharwar craton of India (Ishwar-Kumar et al., 2013a). The major rock types are quartz phengite schist, chlorite schist, fuchsite schist, garnet biotite schist etc. Isochemical phase diagram estimates of the quartz phengite schist suggest peak metamorphic *P-T* conditions were *c.* 18 kbar and 550^o C. Towards the east of the suture Sirsi shelf contains weakly deformed sedimentary rocks, unconformable on high-grade gneisses of the Dharwar craton. The Karwar block to the west of the Kumta suture is mainly composed of undeformed tonalite-trondhjemite-granodiorite (TTG) with minor enclaves of amphibolite cut by later granites. Whole-rock major and trace element data suggest that the TTGs were derived from a volcanic arc, and that the granites have within-plate signatures. Amphibolites have a chemical composition comparable to basalts to basaltic andesites with MORB signatures. The TTGs from Karwar block shows a U-Pb zircon magmatic ages of *ca.* 3200 Ma (Ishwar-Kumar et al., 2013a). The K-Ar biotite age from the TTGs (1746 Ma and 1796 Ma) and amphibolite (*ca.* 1697 Ma) represents late-stage *c.* 1700 Ma uplift event of both TTGs and amphibolites. The Coorg block, which is about 100 km south of Karwar block, contains mainly granulite grade rocks (Chetty et al., 2012; Ishwar-Kumar et al., 2013b; Santosh et al., 2014). Major rocks types are charnockite, mafic granulites, hornblende-biotite gneiss, garnet-hornblende gabbro, anorthosite and granite. The Coorg (Mercara) suture which separates the Coorg block from the Dharwar craton to the east contains garnet-kyanite-sillimanite gneiss, mylonitic gneiss, calc-silicate granulite, mafic granulite, granite and syenite. Pseudosection calculations indicate that the constituent calc-silicate granulite and mafic granulite were re-equilibrated under high-pressure conditions of 15-20 kbar at a temperature of 800-900^o C (Ishwar-Kumar et al., 2013b). Santosh et al. (2014) recorded a metamorphic age of *c.*1200 Ma from metapelites from the Coorg (Mercara) suture zone. Integration of our structural, geological and geochronological results integrated with published data suggests the presence of a 1300-1200 Ma paleosubduction zone in western India. We propose that the Kumta and Coorg sutures are an eastern extension in western India of the northern and southern parts of the Betsimisaraka suture of north-eastern Madagascar.

Keywords: Karwar block, Coorg block, Kumta suture, Dharwar craton, Southern India, India-Madagascar

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SGL43-02 Room:411 Time:May 1 14:30-14:45

Cambrian tonalite from Horei, Ofunato in southern Kitakami Mauntains, Japan

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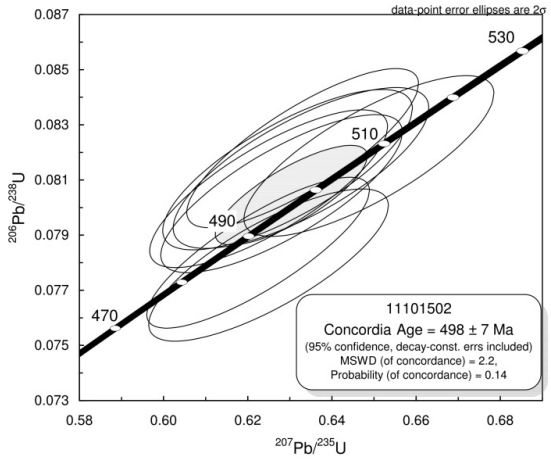
The Lower Cretaceous volcanic rocks of Ofunato Group and plagioclase quartz diorite porphyry dikes are distributed in Ryori district, south Kitakami belt, Japan. The felsic volcaniclastic rocks and tonalite is discovered within the Ofunato Group in Horei, Ofunato, Japan. The felsic volcaniclastic rocks occur as blocks less than 10 m size, and tonalite are found as blocks less than 2 x 1 m in size. The tonalite composed mainly of plagioclase, quartz, biotite, and hornblende and is characterized by poverty of K-feldsper. The tonalite is rich in SiO_2 (73.1–73.4%), and is classified as volcanic arc granite after Pearce et al. (1984). However, it is characterized by low K_2O (0.72–1.27wt%), Rb (16–32ppm), and Ba (91–97ppm) concentrations. This rock is considered to be derived from arc magmatism in immature oceanic arc setting.

U-Pb dating of zircons were carried out using Agilent 7500cx quadrupole inductively coupled plasma mass spectrometer (ICP-MS) with a New Wave Research UP-213 Nd-YAG UV (213 nm) laser ablation system (LA) installed at the Kyushu University (Adachi et al., 2012). Zircon grains from tonalite concentrate around ca. 500 Ma, 8 analyses from 8 grains define a concordia age of 498 +/- 7 Ma. U-Pb zircon age obtained here correspond to latest Cambrian age, and is similar to U-Pb zircon SHRIMP age of the granitic rocks from the Daiouin granite in Hitachi metamorphic rocks (490.8 +/- 6.1 Ma) and the Hikawa granite in Higo metamorphic rocks, Kyushu (502.5 +/- 9.6 Ma) after Sakashima et al. (2003). In addition, Tagiri et al. (2010) described U-Pb zircon SHRIMP age of metamorphic porphyry (505.1 +/- 4.4 Ma) and metamorphic granite clast (499.6 +/- 5.6 Ma), and Tagiri et al. (2011) reported U-Pb zircon SHRIMP age of felsic schist (510.0 +/- 4.0 Ma) from the Hitachi metamorphic rocks. These rocks are considered to be resulted from Cambrian arc-trench system in proto-Japan (Isozaki et al., 2010). In south Kitakami Mountains, Shimojo et al. (2010) described U-Pb zircon SHRIMP age of trondjhemite in Hayachine complex (466 +/- 6 Ma), and Sasaki et al. (2013) reported that the solidification age of the Hikami granites is 450 Ma. In addition, Osanai et al. (in press) described U-Pb zircon LA-ICPMS age of granitic rocks in the Kurosegawa tectonic line in Kyushu (446–472 Ma). These data suggests that the granitic activity in early Paleozoic of proto-Japan arc occurs at ca. 500 Ma and ca. 450 Ma.

Keywords: Kitakami, Cambrian, zircon, U-Pb age, tonalite



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SGL43-03 Room:411 Time:May 1 14:45-15:00

U-Pb ages of zircon in plutonic rocks within the southern Abukuma Mountains

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Abukuma Plutonic and Metamorphic Rocks are widely distributed in the southern Abukuma Mountains. These rocks had been studied in detail (e.g. Miyashiro, 1958; Research Group of the Abukuma Plateau, 1969; Kano et al., 1974; Maruyama, 1979). Radiometric age datings of the Abukuma Plutonic Rocks were carried out by Kawano and Ueda (1965), Maruyama (1978), Shibata and Uchiumi (1983), Shibata (1987), Shibata and Tanaka (1987) and others. These studies indicated that radiometric ages of the Abukuma Plutonic Rocks are almost 90 to 120 Ma. Recently, Ar-Ar age dating of hornblende (Takagi and Kamei, 2008) and U-Pb age dating of zircon (Kon and Takagi, 2012) for plutonic rocks in northern Abukuma Mountains were carried out. They showed that the ages of gabbro and granitic rocks are similar. On the other hand, U-Pb age dating of zircon for plutonic rocks in southern Abukuma Mountains is not yet performed. Therefore, U-Pb age dating of zircon for major plutons of southern Abukuma Mountains was carried out, result of which is reported and tectonics of the Abukuma Mountains is discussed based on the cooling history of the plutons.

Plutonic rocks in the southern Abukuma Mountains are classified into gabbro and diorite, fine-grained diorite, hornblende-biotite granodiorite (Irishiken Pluton, Kamikimita Pluton, Tabito Pluton, Ishikawa Pluton, Miyamoto Pluton and Samegawa Pluton), biotite granodiorite (Torisone Pluton), biotite granite and fine-grained leucogranite, based on the geological relations. The U-Pb ages of zircon for gabbro are 102.7+/-0.8 Ma (Tabito Pluton), 109.0+/-1.1 Ma (Hanawa Pluton), 114.2+/-0.8 Ma (Miyamoto Pluton). As for the hornblende-biotite granodiorite, U-Pb ages are 105.3+/-0.8 Ma (IrishikenPluton), 105.2+/-0.8 Ma (Kamikimita Pluton), 113.8+/-0.7 Ma (Tabito Pluton), 104.4+/-0.7 Ma (Ishikawa Pluton) and 106.4+/-0.8 Ma (Miyamoto Pluton). Also for the biotite granodiorite (Hanawa Pluton), the biotite granite and fine-grained leucogranite U-Pb ages are 105.7+/-1.0 Ma, 104.5+/-0.5 Ma and 100.2+/-0.8 Ma, respectively. These data indicate that the intrusion ages of Gabbro and surrounding granitic rocks are similar to each other. Furthermore, K-Ar ages of biotite and or hornblende, and fission track ages of the same rock samples were measured. Accordingly, it is clear that these rocks had been cooled rapidly to 300 degree C (Ar blocking temperature of biotite) after their intrusion. This implies that the Abukuma Mountains were uplifted rapidly after the intrusion of the Abukuma Plutonic Rocks.

References

Kano, H. et al. (1973) Geology of the Takanuki district. Quadrangle series, 1:50,000, Geological Survey of Japan. 115 p.
Kon Y. and Takagi, T. (2012) Jour. Mineral. Petrol. Sci., vol. 107, 183-191.
Maruyama, T. (1978) Jour. Min. Coll. Akita Univ., Ser. A, 5, p. 53-102.
Maruyama, T. (1979) Basement of the Japanese Islands, 523-558.
Miyashiro, A. (1958) Jour. Fac. Sci.,Univ. Tokyo, Sec. C, vol. 8, p. 245-268.
Research Group of the Abukuma Plateau (1969) Mem. Geol. Soc. Japan, no. 4, 83-97.
Shibata, K. (1987) Jour. Min. Petrol. Econ. Geol., vol. 82, p. 36-40.
Shibata, K. and Tanaka, T. (1987) Jour. Min. Petrol. Econ. Geol. vol. 82, p. 433-440.
Shibata, K. and Uchiumi, S. (1985) Jour. Min. Petrol. Econ. Geol. vol. 82, p. 405-410.
Takagi, T. and Kamei, A. (2008) Jour. Mineral. Petrol. Sci., vol. 103, p. 307-317.

Keywords: Abukuma Granites, Gabbro, Abukuma Belt, UU-Pb age, zircon

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Structural trends and tectonic inversion in Miocene sedimentary basins in the Tsugawa-Aizu province, Niigata prefecture

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The Tsugawa and Mikawa Sedimentary Basins in the northeastern part of Niigata are composed mainly of Early to Middle Miocene formations that contain so-called ”Green Tuff” volcanic sediments. Previous studies emphasized the NW-SE trend in the basement during the genesis of the Tsugawa basin. This outcrop-based study intends to discuss structural trends in the development of the Miocene sedimentary basin in the Mikawa area, Aga Town, Niigata.

The Miocene in this study area are divided into the Kanose, Tsugawa, and Araya/Igashima Formations in ascending order. Sedimentary facies analysis showed that the Kanose and Tsugawa formations filled half graben or graben. N-S to NNE-SSW trending faults of a map-scale limited the extent of the formations. NW-SE trending faults formed minor steps on the basement as well as minor, syn-sedimentary faults in the Miocene. They also affected the dyke intrusion trend. In short, the genesis of the Tsugawa basin involved 2 structural trends in this study area, while more significant is the N-S to NNE-SSW trend.

At present, the extent of the Miocene in this study area is, in many places, limited by thrust faults. Thrust faults locate at the position where rift-border faults are suggested. This indicates that tectonic inversion occurred with reactivation of N-S to NNE-SSW trending faults of the two. The trend of fault reactivation suggests that development of the basin in this study area is influenced by the Shibata-Koide tectonic line.

Keywords: Niigata sedimentary basin, Miocene, rift, structural trend, inversion

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SGL43-P01 Room:Poster Time:May 1 18:15-19:30

K-Ar whole rock dating of the metamorphic rocks in the Yorii-Ogawa area of the north-eastern part of the Kanto Mountains

ONO, Akira[1*]

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Atokura Nappe is widely exposed in the Yorii-Ogawa area. It is mainly composed of Permian granitic rocks, Cretaceous Atokura Formation, Cretaceous pyroclastic rocks, Paleogene Yorii Formation and Paleogene Kiroko greenstone melange (Figure 1). Mid-Cretaceous metamorphic and granitic rocks are also distributed as small tectonic blocks. Kiroko greenstone melange mainly consists of high-pressure-type metamorphic rocks (Kiroko metamorphic rocks), meta-gabbro, meta-tonalite, serpentinite, epidote amphibolite and amphibolite. The Atokura Nappe tectonically overlies on the Mikabu greenstones and Chichibu Complex.

K-Ar whole rock ages of the Kiroko metamorphic rocks were determined on three slates and one mafic rock. The results for the slates are 127Ma, 117Ma and 115Ma. Whereas the K-Ar whole rock age of the mafic rock is 57.4Ma. The older ages of the slates are due to the presence of detrital white mica [1]. Based on the results of the K-Ar ages, the Kiroko metamorphic rocks are regarded as members of Sanbagawa metamorphic rocks. This conclusion reveals that nappe tectonics took place even in the region where Sanbagawa metamorphic rocks were exhumed.

The nappe tectonics occurred at many times in Cretaceous and Paleogene forearcs of Southwest Japan. In the northeastern part of the Kanto Mountains weakly metamorphosed Chichibu complex lie on the Mikabu greenstones by thrust faults [2, 3]. The existence of unconsolidated fault gouges suggests the formation of the thrust faults in a surface part of the crust. The thrust faults were formed by Cretaceous nappe tectonics before the formation of the Atokura Nappe.

Radiometric dating of the metamorphic rocks of the Chichibu and Mikabu belts is lack in the surveyed area. Hence, K-Ar whole rock dating was performed on a muscovite-chlorite schist from the Mikabu belt and a slate from the Chichibu belt. The results are presented on the left side of Figure 1. Locations of the samples are described below and are shown by star signs in the geological map.

The sample Yorii-Mikabu is a pelitic schist of the Mikabu belt exposed near the River Arakawa, Yorii town. The sample Sekisonzan is a weakly metamorphosed slate of the Chichibu belt which was exposed near Mt. Sekisonzan, Ogawa town. The sample Suguro-P2 is a black slate rich in carbonaceous materials and fine white mica. The location of the slate is loc. d of Ref. [1]. It is a member of the Kiroko metamorphic rocks.

Particle sizes of white micas vary considerably for each slate specimen studied. This is an evidence for insufficient recrystallization of white mica during regional metamorphism. Therefore, K-Ar whole rock ages of all the studied slates are older than the assumed metamorphic ages.

[1] A.Ono, 2013, Abs. Japan Geosci. Union Meeting, SMP43-P16.
[2] K.Sudo and K.Matsumaru, 1973, Bull. Chichibu Mus. Nat. History, 17, p.13-24.
[3] T. Kimura, 1977, Abs. Geol. Soc. Japan Meeting, p.104.

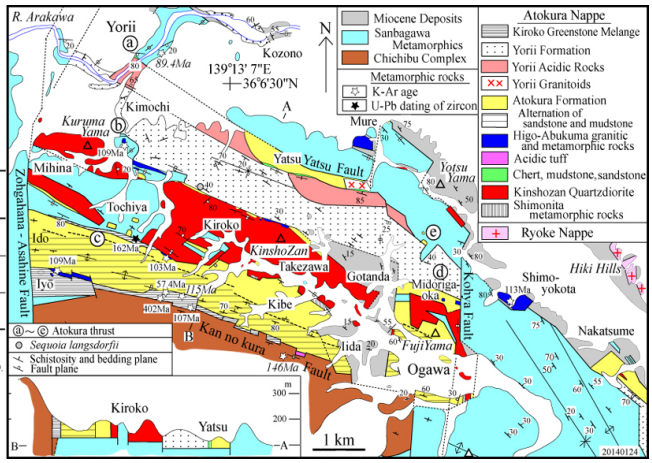
Keywords: Kanto Mountains, Yorii-Ogawa area, Mikabu greenstones, Chichibu Cmplex, K-Ar dating, Nappe

SGL43-P01 Room:Poster Time:May 1 18:15-19:30

New K-Ar whole rock ages of metamorphic rocks from the Yorii-Ogawa area

Sample	Age (Ma)	^{40}Ar rad (scc/g x10^{-5})	^{40}Ar rad (%)	K (%)
Yorii-Mikabu	89.4 ± 2.2	1.34	95.9	3.76
		1.34	95.1	3.76
Sekisonzan	146 ± 4.0	1.60	95.2	2.75
		1.66	95.4	2.76
Suguro-P2	115 ± 3.0	1.86	97.4	4.01
		1.84	97.9	4.01

λ_β =4.962×10^{-10}/yr , λ_ε=0.581×10^{-10}/yr
^{40}K/K=0.01167 atom%
Geospace Science CO.,LTD.



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SGL43-P02 Room:Poster Time:May 1 18:15-19:30

Detrital zircon geochronology of the Tetori Group in the Arimine and Itoshiro areas, central Japan

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Introduction Provenance of the Tetori Group in the Arimine (Toyama-Gifu prefs.) and Itoshiro (Fukui Pref.) areas was analyzed using detrital zircon age distribution. In the course of the study, zircon ages of the Hida gneiss and granitoid were also determined.

Geologic Setting The Tetori Group consists of Middle Jurassic to Early Cretaceous shallow marine to terrestrial deposits. The group is divided, in ascending order, into the Kuzuryu, Itoshiro, and Akaiwa subgroups in the Itoshiro area (Maeda, 1961), and into the Higashisakamori, Nagatogawa, and Atotsugawa formations in the Arimine area (Kawai & Nozawa, 1958); the lower, middle, and upper units of the two areas have been correlated with each other. The lower members of the Nagatogawa-Atotsugawa formations consist of gravelly deposits of eastward running braided rivers, whereas the upper members consist of sandstone and mudstone of southward running meandering rivers. The U-Pb age of a tuff bed in the upper member of the Atotsugawa Formation is 120.0 +/- 1.2 Ma.

Zircon ages from surrounding areas The Hida Gneiss to the west of the Arimine area contains abundant 250-220-Ma zircons (Sano et al., 2000). The Korean Peninsula is mainly occupied by Archean-Paleoproterozoic basements of the Nangnim and Yeongnam massifs, covered with Cambrian-Jurassic deposits and cut by 250-160-Ma granitic rocks (e.g. Zhao et al., 2005). On the other hand, Northeast China between the Jiamusi Massif and the Songliao Basin, famous for " Phanerozoic crustal growth " (Wu et al., 2000), is composed primarily of 250-160-Ma granitic rocks and virtually no Precambrian rocks.

Samples and method of study U-Pb ages of zircons from (1) sandstone and sandy siltstone samples from six formations (members) of the Tetori Group from each area, (2) the Shimonomoto, Funatsu and Utsubo bodies of the Hida granite around the Arimine area, and (3) the Hida meta-granite on the north of the Arimine area were determined with laser ablation inductively coupled mass spectrometers (LA-ICP-MS) equipped in the Earthquake Research Institute of the University of Tokyo and Graduate School of Environmental Studies, Nagoya University.

Results There was marked difference in the percentage of Precambrian zircons (%Pc) between the Itoshiro-Akaiwa subgroups and the Nagatogawa-Atotsugawa formations: i.e. the %Pc of the former is 80 or more whereas that of the latter is less than 10. The samples of the Itoshiro-Akaiwa subgroups contained abundant 2500-1500-Ma zircons and a couple of Archean zircons. Age peaks of 190-170-Ma and 250-220-Ma were commonly seen for all samples of the Tetori Group. Among them, the peak of 250-220-Ma was higher in the braided river deposits and that of 190-170-Ma was higher in the meandering river deposits in the Arimine area. The Shimonomoto, Funatsu, Utsubo, and meta-granite bodies mainly contained 200-180-Ma, 250-190-Ma, 205-185-Ma, and 280-220-Ma zircons, respectively, and 180-170-Ma zircons were rare in the Hida Belt.

Discussion The meandering-river deposits in the Arimine area contain abundant 180-170-Ma zircons, which are virtually absent in the Hida Belt, and very few Precambrian zircons (%Pc $<$10). The catchment of the meandering rivers must have been occupied by Triassic-Jurassic igneous rocks with narrow exposures of Precambrian rocks. Considering the geology of eastern margin of Asia, the meandering rivers most likely passed through Northeast China (Jiamusi-Songliao). On the other hand, the braided river deposits of the area contain many 250-220 Ma zircons, suggesting that they were likely supplied at the time of uplifting of the Hida gneiss to the west. On the other hand, the Itoshiro-Akaiwa subgroups have abundant Precambrian zircons (%Pc $>$80). Possible candidates of the Precambrian exposure that could supply the sediments of these subgroups are the Yeongnam-Nangnim massifs. Hence the sediments of the Itoshiro-Akaiwa subgroups were likely carried by rivers that passed through the massifs.

Keywords: U-Pb age, detrital zircon, LA-ICP-MS, Tetori Group, Northeast China, East Asia

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Quaternary Tectonic Environments in North-Central Japan

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The present-day central Japan is located at the convergent junction area among four tectonic plates, Amur, Okhotsk, Philippine Sea and Pacific plates. The Toyama Trough - Fossa Magna region is a major tectonic depression bounding the contrasting, tectonic provinces, i.e. the Northeast Japan (NEJ) arc on the Okhotsk plate and the Southwest Japan (SWJ) arc on the Amur plate. The north-central Japan on the Japan Sea side of Honshu Island is characterized by the latest Cenozoic thrust/fold belts, which are considered as the results of a series of inversion/conversion tectonics in relation to the Quaternary changes in relative motion between Eurasia/Amur and Philippine Sea plates.

This paper aims at describing these changes in crustal movements including active tectonics, and evaluates the existing hypotheses on the plate tectonic framework.

At the end of Pliocene in the NEJ arc, typical basin inversion has been occurred along the NE-SW trending, boundary faults of the Miocene sedimentary basins. While, on the side of SWJ arc, boundary faults of the Miocene basins were not reactivated, but other preexisting fractures have been reused to form the reverse fault and strike-slip fault provinces in response to N-S compression due to the Early Pleistocene northward subduction of the Philippine Sea plate, and to E-W compression due to the eastward motion of Amur plate, although the Present tectonic zone of strain concentration is probably related to the subduction of Pacific plate. In order to account for the Quaternary tectonic environment with a widespread stress field of strike-slip faulting in the basement as inferred from focal mechanism solutions, an accommodation mechanism is likely to have been worked in the asthenospheric mantle of the present arc-arc collision zone.

Considering the above neotectonic circumstances from the existence of the tectonic inversion of north-central Japan and stress field of the seismogenic layer, the hypotheses on eastward motion of Amur plate and on the nascent plate-boundary along the eastern margin of Japan Sea were positively evaluated.

Keywords: Amur Plate, Toyama Trough, Fossa Magna, Quaternary, neotectonics, north-central Japan

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Fracture system in the Sawara Granite at the area beside the Hinatatoge-Okasagitoge Fault, northern Kyushu

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The Hinatatoge-Okasagitoge Fault has been identified by recent research. This fault continues to the Maebaru and Itoshima-hanto-oki Faults Group, and forms a single fault zone (Shimoyama et al., 2013). Activity rank of this fault is estimated C class. We recorded fractures in the Sawara Granite at the area beside the Hinatatoge-Okasagitoge Fault, and examined formation history of fracture system.

The fractures in the surveyed area are classified by their orientations into three types: NNW-SSE to NW-SE-oriented high-angle fractures, ENE-WSW-oriented high-angle fractures, and low-angle fractures. The fractures are further divided into three groups: minor faults associated with cataclasite, minor faults associated with fault gouge, and joints.

Based on the crosscut relationships of these fractures and the mineralization along joints, the formation process of the fractures related to activity of the Hinatatoge-Okasagitoge Fault involves five stages.

The minor faults associated with cataclasite were formed at the first stage. The laumontite veins were precipitated in spaces formed by the opening of joints at next stage. At the third stage, the minor faults associated with fault gouge were formed. The stilbite veins were precipitated in spaces formed by the opening of joints at next stage. At the last stage, the minor faults associated with fault gouge were formed.

Keywords: Hinatatoge-Okasagitoge Fault, Sawara Granite, fracture system, hydrothermal activity

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Bouguer gravity anomaly related to Cretaceous volcanic rocks in the Yanahara area, Okayama prefecture, SW Japan

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Cretaceous volcanic rocks (volcanic, pyroclastic and lesser sedimentary rocks) unconformably overlying the basement rocks composed of the Maizuru Group and the Yakuno complex are widely distributed in the region from Okayama to Hyogo Prefectures, central Chugoku, SW Japan. Remarkable low gravity anomalous areas observed in the region of these volcanic rocks suggest some cauldrons. Total 610 observation points including 411 new points and 199 published points (GSJ, 2000; Shichi and Yamamoto, 2001) depict a detailed Bouguer gravity anomaly map of the Yanahara district through the band-pass filter between 1 to 30 km after the terrane and Bouguer corrections with a density of 2670kg/m3.

The Bouguer gravity anomaly map reveals low gravity anomalous areas corresponding with the Cretaceous volcanic rocks and the related granitic intrusive rocks; whereas high gravity anomalous areas corresponding with the Maizuru Group and the Yakuno complex.

The low gravity anomalous areas of the Yanahara district are observed in two parts: western and northeastern areas. The western low gravity anomalous area, measuring 20×7km in size, shows a flat-floor type anomaly surrounded with high gradient margins. The relative anomaly value is 8mgal less than that of the peripheral area. This suggests a flat-floor caldera (cauldron) filled up with thick rhyolitic volcanic rocks. This inferred caldera was possibly produced 80Ma, because quartz diorite intruded into this caldera has been dated as 79.8±1.8Ma by biotite K-Ar method.

Another area northeast of Yanahara shows an elongated funnel floor surrounded with high gradient margin. The anomaly value is 7mgal less than that of the peripheral area. This value is nearly equivalent to the gravity anomaly in the above mentioned western area. Accordingly, another lesser cauldron possibly lies in this area.