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Radiocarbon Ages of the Beach Rocks on Okinawa, Miyako and Ishigaki Islands, the Ryukyus, Japan

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Data

Radiocarbon Ages of the Beach Rocks on Okinawa, Miyako and Ishigaki Islands, the Ryukyus, Japan

Toshio KAWANA *

No. 1: Okinawa Island.
Age of the specimen: 2,050 ± 85 y. B. P. Half life of carbon-14 is 5,568 years (Libby's value). Half life of carbon-14 for the specimens of the No. 2 ~ No. 5 is the same value.
Material: Shell.
Laboratory: Japan Radioisotope Association.
Laboratory No.: N-3, 708.
Taxa of the specimen: *Tridacna (Flodacna) squamosa* Lamarck.
Identifier: Itsuro OSHIRO (Okinawa Prefectural Museum).
Collected date: 8 October 1978.
Collector: Toshio KAWANA.
Locality: 26°27′53″ N, 127°58′17″ E, Ginoza-son, Kunigami-gun, Okinawa prefecture.
Description of the beach rock:

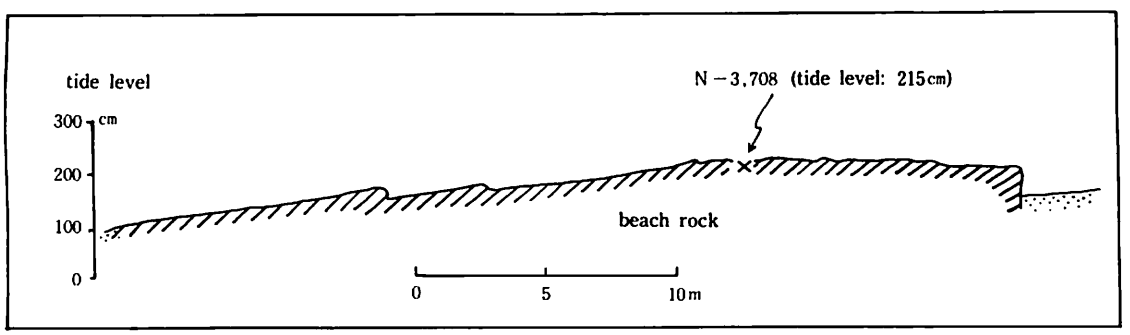

Fig.1. Section of the beach rock at Ginoza, Okinawa Ialand

The beach rock is 250 m long and 30 m wide. The specimen was collected from the top layer of the beach rock. The tide levels at Naha port on Okinawa Island are calculated as shown in Table1.
Comment: In general, it is considered that the age of a specimen, a body of an organism, in a beach rock indicates the age when the organism lived in the habitat. Bodies of organisms are transported to the shore and are mixed with shore deposits, resulting in the appearance of a beach rock in some condition. It is, therefore, assumed that the age of the beach rock is younger than that of the

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Table 1. Tide levels at Naha port

MHHWL	mean highest high water level	217 cm
MHWL	mean high water level	180
MSL	mean sea level	118
MLWL	mean low water level	52
MLLWL	mean lowest low water level	−4

after KAWANA and NISHIDA (1980)

specimen.

It is inferred that the upper part of the beach rock in this area was formed after about 2,000 y. B. P. But the precise age of the beach rock is still unsolved.

On the assumption that a beach rock is formed vertically within an intertidal range, it is considered that the former sea level height of the beach rock environs was almost the same as the present one, because the elevation of the beach rock is nearly within the present tidal range. This point, however, should be further studied in detail, because relation between a tidal range and formation of a beach rock still seems to be indefinite.

No. 2: Okinawa Island.
Age of the specimen: 790 ± 70 y. B. P.
Material: Shell.
Laboratory: Japan Radioisotope Association.
Laboratory No.: N-3, 709.
Taxa of the specimen: *Turbo (Lunatica) marmorafus* Linné.
Identifier: Itsuro OSHIRO.
Collected date: 28 October 1979.
Collector: Toshio KAWANA.
Locality: 26°42′17″ N, 127°52′55″ E, Bise, Motobu-cho, Kunigami-gun, Okinawa prefecture.
Description of the beach rock:

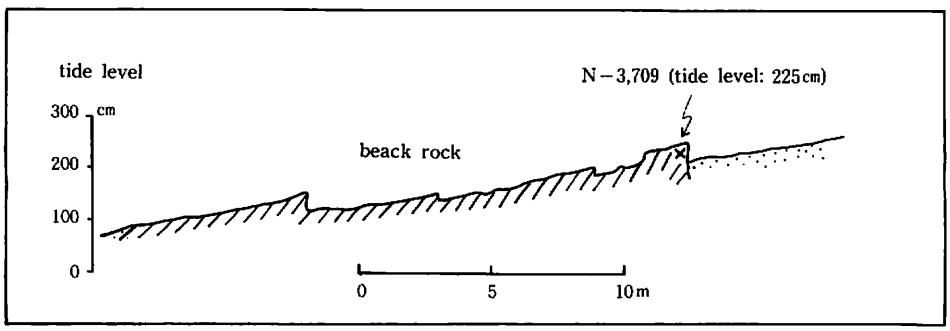

Fig.2. Section of the beach rock at Bise, Okinawa Ialand

The beach rock is 250 m long and 20 m wide. The specimen was collected from 5 cm below the surface of the beach rock. The tide levels shown in Table 1 are applicable to this locality.

Comment: It is inferred that the upper part of the beach rock in this area was formed after about 800 y. B. P.

No. 3: Miyako Island.
Age of the specimen: 2,120 ± 75 y. B. P.
Laboratory: Japan Radioisotope Association.
Laboratory No.: N-3, 825.
Taxa of the specimen: *Tridacna (Flodacna) squamosa* Lamarck.
Identifier: Itsuro OSHIRO.
Collected date: 15 January 1980.
Collector: Toshio KAWANA.
Locality: 24°40′17″ N, 125°21′34″ E, Tomori, Gusukube-cho, Miyako-gun, Okinawa prefecture.
Description of the beach rock:

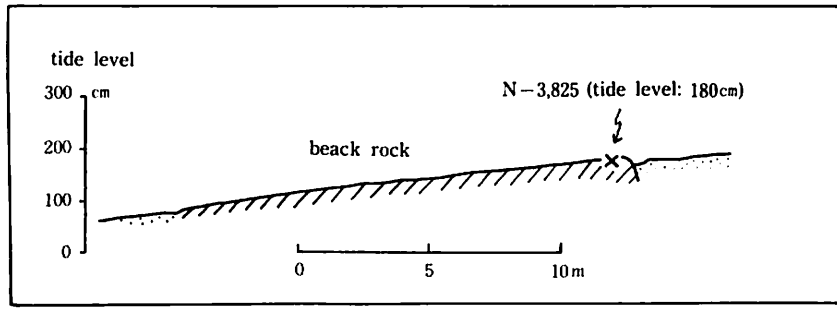

Fig.3. Section of the beach rock at Tomori, Miyako Island

The beach rock is 50 m long and 18 m wide. The specimen was collected from the top layer of the beach rock. The tide levels at Hirara port on Miyako Island are calculated as folllows:

Table 2. Tide levels at Hirara port

MHHWL: 190 cm, MHWL: 155 cm, MSL: 102 cm, MLWL: 45 cm, MLLWL: −5 cm

after KAWANA and NISHDA (1980).

Comment: It is characteristic of Miyako Island that the elevation of the retreat points of the notches are almost within the limits of the intertidal range. This fact suggests that the relatively stable sea level around this island has been kept during the late Holocene time (KAWANA and NISHIDA, 1980). It is assumed that the beach rock in this area was formed within the intertidal range in the period of stable sea level condition.

No. 4: Ishigaki Island.
Age of the specimen: 1,130 ± 75 y. B. P.
Material: Shell.

Laboratory: Japan Radioisotope Association.
Laboratory No.: N-3, 711.
Taxa of the specimen: *Hippopus hippopus* (Linné).
Identifier: Itsuro OSHIRO.
Collected date: 21 October 1979.
Collector: Toshio KAWANA
Locality: 23°26′51″ N, 124°09′24″ E, Yoshihara, Ishigaki-shi, Okinawa prefecture.
Description of the beach rock:

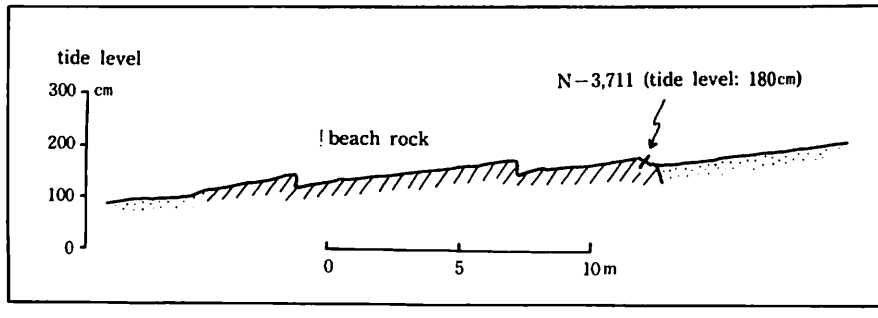

Fig.4. Section of the beach rock at Yoshihara, Ishigaki Island

The beach rock is 90 m long and 17 m wide. The specimen was collected from the top layer of the beach rock. The tide revels at Ishigaki port on Ishigaki Island are calculated as follows:

Table 3. Tide levels at Ishigaki port

MHHWL: 185 cm, MHWL: 150 cm, MSL: 100 cm, MLWL: 48 cm, MLLWL: −2 cm
after KAWANA and NISHIDA (1980)

Comment: The age of the upper part of the beach rock at Kojima (24°27′08″ N, 124°08′56″ E), near this locality, indicates 1,440 ± 90 y. B. P. (KONISHI and MATSUDA, 1980), which is close to the age of the upper part of the beach rock at Yoshihara. There is a possibility that these two beach rocks were formed during about the same period.

No. 5: Ishigaki Island.
Age of the specimen: 1,130 ± 75 y. B. P.
Material: Shell.
Laboratory: Japan Radioisotope Association.
Laboratory No.: N-3, 710.
Taxa of the specimen: *Hippopus hippopus* (Linné).
Identifier: Itsuro OSHIRO.
Collected date: 20 October 1979.
Collector: Toshio KAWANA.
Locality: 24°28′09″ N, 124°08′10″ E, Kabira, Ishigaki-shi, Okinawa prefecture.

Description of the beach rock:

The beach rock is 150 m long and 15 m wide. The tide levels shown in Table 3 are applicable to this locality.

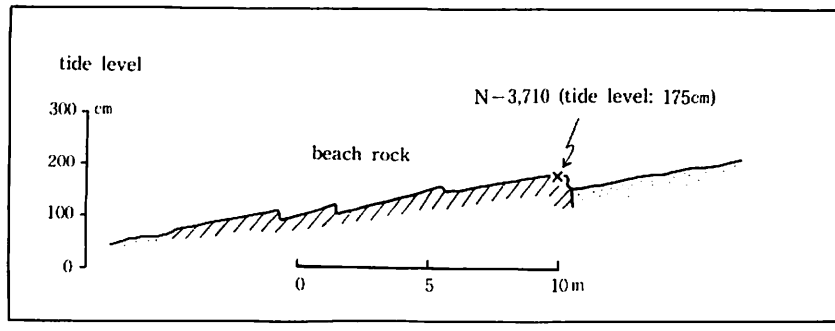

Fig.5. Section of the beach rock at Kabira, Ishigaki Island

Comment: The age of this locality is the same as that of Yoshihara mentioned above. The coincidence of the ages suggests that these two beach rocks were formed at the same period.

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