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215. A MIOCENE CRAB, *HYAS TSUCHIDAI* N. SP. FROM THE WAKKANAI FORMATION OF TESHIO PROVINCE, HOKKAIDO

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稚内層産ツチダノヒキガニ：　北海道天塩国豊富村沙流沙流別パンケエペコロベツ川支流南岸，豊富ロータリー 2 号井の櫓下の稚内層より土田定次郎により採集されたツチダノヒキガニは寒流系の現生種 *Hyas coarctatus* LEACH 等に近縁を有する。従来 Austria, Preding の Helvetian より *Hyas meridionalis* GLAESSNER, 1928 が Algeria, Oran の Sahelian より *Hyas oranensis* VAN STRAELEN, 1936 が報告されている。　今泉力蔵

The fossil crab described herein was collected by Mr. T. TSUCHIDA of the Teikoku Oil Company from the upper Miocene Wakkanai formation at Saro, Toyotomi-mura, Teshio Province, Hokkaido, along the south bank of the Sarubetsu, a tributary of the Pankeepekorobetsu and kindly submitted by him to the writer for study.

The writer proposed a new specific name *Hyas tsuchidai* for this fossil form, the specific name was dedicated to the collector of the specimens.

All the recent species of the genus *Hyas* are the inhabitants of the Arctic circle, except for only one subspecies, *Hyas coarctatus ursinus* RATHBUN, which is now known to be distributed from the Okhotsuk Sea to Amoy along the South China Sea via the Japan Sea, as stated below again. The exceptional distribution just mentioned is evidently controlled by the cold Liman stream. Therefore, the occurrence of the fossil crab suggests that the Wakkanai formation which has yield this species was deposited in the same ecological condition as the Recent species of the genus are governed. The first described fossil species *Hyas meridionalis* GLAESSNER was found in the Helvetian stage of Wenzeldorf, Preding, Austria. This fossil record from Austria seems to me to indicate the influence of a cold current in that region during that period.

The writer wishes to express his sincer thanks to Mr. T. TSUCHIDA for his kind offer of the fossil crab, and also to Dr. H. YABE, Prefessors S. HANZAWA and K. ASANO and Dr. K. HATAI of the Institute of Geology and Paleontology, Tohoku University, for their encouragement.

Family *Majidae* ALCOCK

Subfamily *Hyasteniinae* BALSS

Genus *Hyas* LEACH 1814

Genotype, *Hyas araneus* (LINNAEUS), RATHBUN, M. J., 1925, U. S. Nat. Mus. Bul. 129, Smith. Inst., p. 252.

Hyas tsuchidai IMAIZUMI, n. sp.

Preservation:—one carapace and its impression preserved in a gray tufface-

1) Read June 30, 1951; received Feb. 5, 1952.

ous fine sandstone. It is compressed towards the right frontal direction but exposes the left lateral side and the orbital cavity as a result of the left supra-orbital eave and the left post-ocular cup being shoved towards the frontal region. Right branchial regions with numerous wrinkles extending from the posterior margin to the anterolateral, due to subsequent pressure.

The color of the fossil is brownish sepia. Convex parts of the carapace and the tops of the tubercles are worn, but the concave surface of the impression is well preserved. Appendages lost.

Description:—carapace broad, sub-triangular of lyrate in shape, but narrower than the post frontal length. Rostrum triangular, flat, bifid, a narrow cleft between rostral horns, the tips more or less separated; tips of horns subacute. Cavity of orbit oblong-spheroidal. Post-orbital and hepatic region not dilated laterally, antero-lateral margin of hepatic region sharp with a rounded postero-lateral angle. Postero-lateral margin of carapace rounded. Cervical groove distinct, marginal line interrupted by a small and shallow sinus between hepatic and branchial regions. Surface uneven, ornamented with granules and granular tubercles, especially on median gastric area or proto- and meso-gastric regions and in an oblique row on branchial region. Meso-gastric region with two large median tubercles. Proto-gastric region with two inner and three outer tubercles arranged side by side: the inner two tubercles in proto-gastric region continue with smaller ones to frontal region. Pustules on inner side of outer surface of horns of rostrum decrease in size anteriorly. Row of tubercles along boundary between meso- and meta-branchial regions distinct. Lateral margin of carapace tuberculate behind hepatic rigion. Outer surface of rostrum densely granulate. Granules on gastric, cardiac and intestinal region also densely arranged. Epi- and meta-branchial regions distinct.

Dimensions:—carapace, length 16mm. width 13mm.
rostrum, width 2.5mm.
proto- and meso-gastric region, width 5mm.

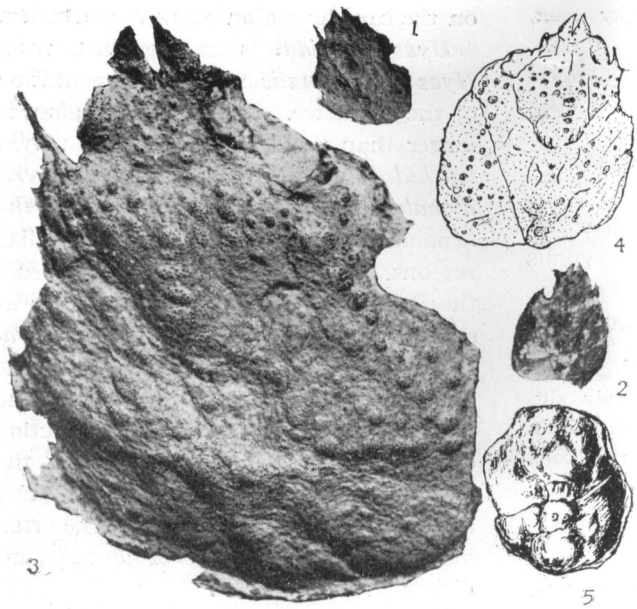
Holotype:—IGPS coll. cat. no. 74001.

Locality and geological horizon:—IGPS loc. no. Te-10. Under the derick of the boring "Toyotomi" Well no. 2 of the Teikoku Oil Co. at Saro on the bank of the Sarubetsu, a tributary of the Panke-epekorobetsu-gawa, Sarobetsu, Saro, Toyotomi-mura, Teshio Province, Hokkaido, (Toyotomi sheet), Lat. 45°4′ 43″ N., Long. 141°50′ 10.″4 E., Wakkanai formation, upper Miocene. T. TSUCHIDA coll. 1950.

Geographical distribution of the Recent species of the genus *Hyas*:—According to RATHBUN (1925, pp. 252–281) and SAKAI (1934, p. 295, 1935, p. 94), this genus is now living in Arctic Ocean with the exception of the Siberian coast between Long. 147°E. and the Kara Sea, south of Novaya Zemlya and of the American coast between Baffin Bay and Langton Bay, North West Territories; Bearing Seas in the Arctic circle, besides, North Pacific Ocean southward along the Asiatic side to Korea and perhaps Amoy, and on the American side to the state of Washington; North Atlantic, Cape Hatteras, North Carolina, and on the European side to the English channel.

The geographical distribution of the species.

1. *Hyas araneus* (LINNAEUS), (RATH-



A Miocene Crab, *Hyas Tsuchidai* n. sp. from the Wakkanai formation of Teshio Province, Hokkaido.

Text-fig. 1. *Hyas tsuchidai* IMAIZUMI n. sp. Holotype, ×1.

Text-fig. 2. Impression of holotype, ×1.

Text-fig. 3. The same specimen as text-fig. 2, enlarged to show details, ×5.

Text-fig. 4. Holotype restored, ×2.

Text-fig. 5. A copy of *Hays meridionalis* from GLAESSNER's fig. 15, Taf. III.

BUN, 1925, p. 258), type-locality, North Sea.

West coast of Greenland from Lat. 69°15′ to 64°11′ N., Labrador at Hebron, about 60°E., in Kara Sea,? Atka, Aleutian Isls.

The species ranges from tidal zone to 500 meters in depth with a temperature gradient of 29.°7-64.°5 F., (RATHBUN, 1925, pp. 255-257, 1925, p. 270). The bottom materials from where the species has been collected comprises sands, pebbles and gravels and broken shells, rarely silts (RATHBUN, 1925, pp. 255-257).

2. *Hyas coarctatus* LEACH, (RATHBUN, 1925, pp. 259-268), type locality, North Sea.

From West (Lat. 70°25′ N.) and East Greenland (Lat. 60°N.) to Hudson Strait and Bay, thence southward via Kamtchatka and Sakhalin Isl. to Yeso Strait and through the Sea of Japan to Korea (Lat. 37°02′ N.); subspecies, *ursinus* RATHBUN, Shanghai, Amoy (Lat. 24°30′ N.)

Iceland, Arctic coast of Europe to Long. 49°30′ N.

Corst of Siberia and northward, as far west as Bennett Isl. (about 147°E.) as north as 76°50′ N. to East Cape.

The species ranges from low water mark to 682 meters in depth with an exceptional record of 1656 meters in depth (W. Atlantic). The temperature ranges from 29.°8-52.°9 F. (RATHBUN, 1925, pp. 260-268). The bottom materials comprises silts, sands, pebbles, gravels and shells (RATHBUN, 1925, pp. 260-268).

T. SAKAI (1934, p. 295) reported two female specimens in the collection of the surveying ship Oshioro-maru of the Fisheries Department of the Hokkaido University from the East China Sea (loc. unknown), subspecies, *altaceus* BRANDT. T. SAKAI states that *Hyas coarctatus* has never been recorded from the Pacific side of Honshu of Japan.

3. *Hyas lyratus* DANA, (RATHBUN, 1925, p. 275), type locality, Oregon coast.

Bearing Sea, from a line connecting Bearing Isl., Commander Isls., Siberia, with Pribilof

Isl. and Bristol Bay, Alaska (greatest Lat. 58° 38′30″ N.), southward to Admiralty Inlet, Washington (about Lat. 48°N.).

This species ranges from 9 meters to 440 meters depth (RATHBUN, 1925, pp. 271-275). The bottom materials comprises silts, sands, pobbles, gravels and broken shells (RATHBUN, 1925, pp. 271-275).

Geological and geographical distribution of the fossil species of the genus *Hyas* ever recorded.

1. *Hyas meridionalis* M. F. GLAESSNER, 1928, (text-fig. £), type locality,

Wenzeldorf of Preding, Austria, sandy silt, Helvetian, and Gamlitz, torton Leithakalk, Baden, Korallenkalk of Rauchstallbrun, coll., Joanneum Graz.

2. *Hyas oranensis* V. VAN STRAELEN, 1936, type locality, Oran,

Algeria, limy rock, Sahelian, depository, Muséum national d'Histoire naturelle, Paris.

Remarks:—According to M. F. GLAESSENR's description of *Hyas meridionalis*, " Die Verwandten der Übringen Tertiärfauna unseres Gebietes finden sich dagegen grösstenteils in tropischen Meeren, zum geringeren Teil ins Mittelmeer." The specimen of *Hyas meridionalis* is incomplete, its carapace is very convex, especially in the gastric region, the hepatic region is dilated laterally but less weiter than *Hyas coarctatus*. The surface of *Hyas meridionalis* is covered with granules and pustules, the pustules on the cardiac region being very distinct.

Hyas tsuchidai is distinguished from *Hyas meridionalis* by the ornamentation of the carapace. The hepatic region is larger than the intestinal region in *Hyas tsuchidai* but the reverse in *Hyas meridionalis* and from *Hyas oranensis* by the ornamentations of the gastric and cardiac regions. It is also distinguishable from the Recent species of the genus *Hyas* as stated below, the rostrum of *Hyas araneus* resembles *Hyas tsuchidai* but the one of *Hyas tsuchidai* is broader and the posterior angles of the hepatic projection of the former species subacute but the later has broadly rounded posterior angles of the hepatic region. The ornamentation of the surfaces of the carapace differs in both species.

From *Hyas coarctatus*, the shapes of the carapace, the rostrum and the hepatic region and the ornamentation of the carapace serve to separate *Hyas tsuchidai*. The shapes of the proto- and the meso-gastric regions are similar in both *Hyas lyratus* and *Hyas tsuchidai*.

Hyas tsuchidai resembles *Hyas araneus* in the shapes of the gastric regions and *Hyas lyratus* in the shape of the rostrum.

Dimensions of the carapace of Recent species are as follows,

		(length)	(width)
Hyas araneus	(RATHBUN, 1925, p. 258)		
	female	72.4mm.	54mm.
	male	94mm.	72mm.
	male, Iceland	110mm.	86mm.
Hyas coarctatus	(RATHBUN, 1925, p. 269)		
	male, altaceus, Grande Bands	80mm.	64.5mm.
	male, west Greenland	99mm.	74mm.
	the largest specimen of America, male	30.2mm.	19 7mm.
	the largest specimen known of the typical form, male, Murman Sea	51.5mm.	35mm.
Hyas lyratus	(RATHBUN, 1925, p. 275)		
	male	105mm.	80mm.

The length of the carapace of *Hyas oranensis* from the Sahelian of Oran, Algeria is more than 30mm. and its width more than 34mm. The fossil species from the Helvetian of Austria and from the upper Miocene of Japan are both small in size, and they may be considered as dwarf species.

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Memorial to Thomas Wayland VAUGHAN

By Shoshiro HANZAWA

Dr. Thomas Wayland VAUGHAN, one of America's most distinguished scientists passed away on January 16, 1952 at the age of 81 in Washington, D. C. He was born in Jonesville, Texas on September 20, 1871.

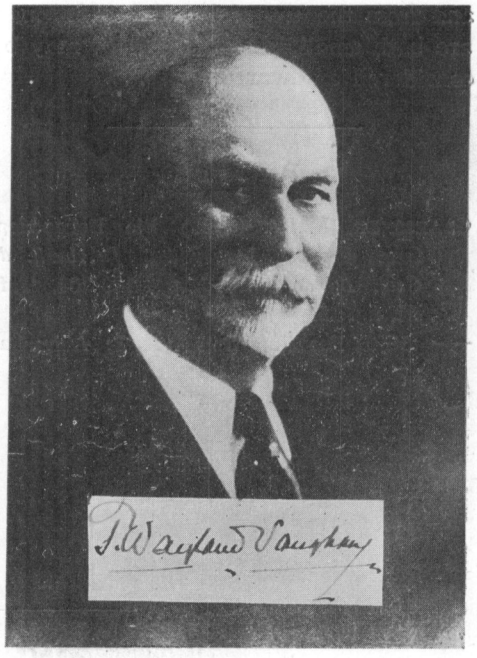
After he received a B. S. degree from Tulane University in 1889 and a M.A. and a Ph. D. degrees at Harvard University in 1894 and 1903, respectively, he served as geologist in the U.S. Geological Survey from 1907 to 1939. He was also attached as paleontologist to the National Museum, Washington, D.C. from 1924 to 1942. He was Director of Scripps Institution of Oceanography, University of California at La Jolla, California in 1924-1936. and was appointed Director Emeritus thereafter.

Dr. VAUGHAN was devoted to the study of the Cretaceous and Tertiary larger Foraminifera and Corals from southern states of North America, Central and South Americas and the West Indies, and of the Recent corals of Hawaii and Torres Strait. He extended his research to problems relating to configuration of the ocean bottom, marine sediments, and ecology of marine organisms, and made a great contribution to the coral reef problems.

He was the author of many new species and several new genera of Cretaceous and Tertiary Foraminifera and corals from the aforementioned regions. In recognition of his great paleontological achievement, his name was dedicated to many foraminiferal and coral species and genera by various authors.

For his brilliant accomplishment in the scientific world, he was awarded an LL. D. by the University of British Columbia in 1933 and by the University of California in 1936, an honorary D. Sc. by Tulane University in 1944, Agassiz medal of the National Academy of America in 1935, the Mary Clark Thompson medal in 1945, and the Penrose medal of the Geological Society of America in 1946. He also served as President of the Geological Society of America in 1936.

His personal contact with the Japanese scientists begun in 1920 when he was one of the American delegates to the



First Pan-Pacific Science Congress, Honolulu, Hawaii. He came twice to Japan. His first visit to Japan as one of the American delegates to the Third Pan-Pacific Science Congress, Tokyo was in 1926. During his second visit to Japan on his trip around the world in 1933, he was gracefully granted by Emperor Hirohito of Japan in private audience. He was awarded by the Japanese Government the Order of the Rising Sun, third class and a beautiful vase cloissonné. He was well acquainted with the history of Japan and loved Japanese customs, arts and the Chinese poems, moreover, he always endevored to understand the oriental people, and mastered the sixth grade Japanese reader when he was Director of the Scripps Institution of Oceanography at La Jolla. He had many friends among the Japanese geologists, paleontologists, biologists, and oceanographers who all enjoyed his friendship until his death. He was active in his field until 1947.