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218. A MIOCENE CRAB, *TYMOLUS KAMADAI* N. SP. FROM
THE NUMANOUCHI FORMATION OF THE JOBAN
COAL-FIELD¹⁾

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福島県石城郡沼之内層産カマダノマメヘイケ：鎌田泰彦が福島県石城郡高久村小堂堤東岸及江名町三崎の中新統沼之内層から採集したカマダノマメヘイケは幼年のヘイケカニ等に間違われるほど小さいがあきらかにマメヘイケ属に入れられる。近縁の現生種は暖流系に属するがその北限は函館にまで及ぶ。今泉力藏

The fossil crab which is considered to be a new species, was collected by Mr. Y. KAMADA from the Miocene Numanouchi formation at Kosuganotsutsumi, Takaku-mura and Misaki, Ena-machi, both in Iwaki-gun, Fukushima Prefecture. It seems to represent a mature specimen belonging to the genus *Tymolus*.

The writer wishes to express his hearty thanks to Mr. KAMADA who collected and offered the fossil crab and also to Dr. H. YABE, Professors S. HANZAWA, and K. ASANO and Dr. K. HATAI of the Institute of Geology and Paleontology, Tohoku University for their encouragement.

Family *Dorippidae* DANA 1852

Subfamily *Tymolinae* ALCOCK 1896

Genus *Tymolus* STIMPSON 1858

Genotype, *Tymolus japonicus* STIMPSON.
Type locality, Hakodate Bay, Japan. SAKAI, T., 1937, *Sci. Rep. Tokyo Bunrika Daigaku*, Sec. B, vol. 3, p. 68.

Tymolus kamadai IMAIZUMI, n. sp.

Text-figs. 1, 2.

Preservation:—Mould of the carapace embedded in the gray tuffaceous sandstone.

K. HATAI identified the following fossils which were attached to the same specimen.

Tellina vestaloides YOK. n. subsp.

Macoma cf. *tokyoensis* MAK.

Nassarius sp.

Nuculana sp.

Description:—carapace subcircular, almost as long as broad. Width of orbital border about 1/2 of carapace. Gastric, cardiac and branchial region well delimited and convex. Antero-lateral borders characterized by having two tubercles; last one sharp. Posterior border concave in the middle or intestinal region.

Meso- and meta-gastric region triangular in shape, cardiac region somewhat acute in the posterior part. Proto-gastric region U-shaped, with a pustule on the outer anterior side. Tips of rostrum obscure, lateral frontal teeth of rostrum projecting outwards. External orbital teeth thin and its projecting tip broken.

Dimensions:—

carapace, length 10mm., width 12mm.

width of the posterior border 6.5mm.

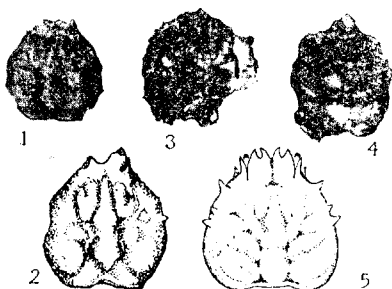
width of the base of the rostrum 4.5mm.

Holotype:—IGPS coll. no. 74002.

Locality and geological horizon:—IGPS

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

loc. no. Fs-14; east cliff of Kosugano-tsutsumi, Takaku-mura, Iwaki-gun, Fukushima Prefecture, (Taira sheet), Lat. $37^{\circ}1' 16''.2$ N., Long. $140^{\circ}57' 45''.2$ E., Numanouchi formation, Miocene, Y. KAMADA coll., 1948.



Text-figs. 1-4, *Tymolus kamadai* n. sp.

Text-fig. 1, holotype, nat. size.

Text-fig. 2, the figure of the holotype, $\times 6/5$.

Text-fig. 3, the referred specimen, the mould of the carapace, $\times 8/5$.

Text-fig. 4, the cast of the carapace, the same specimen as text-fig. 3, $\times 8/5$.

Text fig. 5, *Tymolus japonicus* STIMPSON after SAKAI's Fig. 4, 1937, nat. size.

Referred specimen:—IGPS coll. cat. no. 74308, text-figs. 3, 4.

Locality and geological horizon:—Mitsuki, Ena-machi, Iwaki-gun, Fukushima Prefecture, (Onahama), IGPS loc. no. Fs-21, Lat. $36^{\circ}55' 56''.8$ N., Long. $140^{\circ}55' 19''.3$ E., Numanouchi formation, Miocene, Y. KAMADA coll., 1952.

Preservation:—a mould and its cast of the carapace embedded in the yellowish gray soft tuffaceous sandstone.

Dimensions:—

carapace, length 13mm., width 13mm.
width of the posterior border 7mm.
width of the base of the arostrum 5mm.
width of the gastric-cardiac region 4mm.
U-shaped proto-gastric region, length 3mm., width 3mm.

2 or 3 pustules of the antero lateral border of the referred specimen are dis-

inct. The right outer orbital spine can be obscurely seen at the base of the rostrum.

Geographical distribution of the living species:—the genus *Tymolus* contains eight species, of which two are known from Havana in Cuba (232-441m.), one from Australia and the others from the Indo-Pacific, Barbades (365m.), West Indies (212 and 216m.). Two species have been reported from Japan; they are (SAKAI, 1937, p. 68, EDWARDS et BOUVIER, 1902, p. 94)

Tymolus japonicus STIMPSON, 1858, type loc., Hakodate Bay, Japan.

Tymolus uncifer (ORTMANN), 1892, type loc., Sagami Bay, Japan.

The distribution of the Japanese Recent species of *Tymolus* is as follows.

Tymolus japonicus is found in depths of 50-350m. on muddy or sandy bottoms, it ranges from Hokkaido to Kyushu, and has been recorded by Y. YOKOYA from the following localities (YOKOYA, 1933, pp. 105-107).

1. Between Shiriya-zaki, Aomori Prefecture and Todosaki, Iwate Prefecture, in 86, 91m.
2. Near Todo-saki, Iwate Prefecture in 130, 135, 150, 152, 154, 190m.
3. Between Todo-saki, Iwate Prefecture and Kinkazan, Miyagi Prefecture in 165m.
4. East of Kinkazan, Miyagi Prefecture in 320-314m.
5. South of Kinkazan, Miyagi Prefecture in 146m.
6. South of Shiwoya-zaki, Fukushima Prefecture in 99m.
7. South of Inubô-saki, Chiba Prefecture in 123, 238m.
8. Coast of Bôshu Chiba Prefecture in 130m.
9. Sagami Bay, Kanagawa Prefecture in 165m.
10. Near Maisaka, Shizuoka Prefecture in 192m.
11. Suruga Bay, Shizuoka Prefecture in 110, 123, 128m.

12. South of Toba, Mie Prefecture in 207, 291m.
13. East of Owase, Mie Prefecture in 132m.
14. South of Atsumi, Aichi Prefecture in 91m.
15. West of Ashizuri-zaki, Kôchi Prefecture in 296m.
16. West of Tanegashima Isls. in 203m.
17. South of Koshiki Isls., Kagoshima Prefecture in 132m.
18. South of Gotô Isls., Fukuoka Prefecture in 324m.
19. West of Tsushima Isl., Fukuoka Prefecture in 115m.
20. North of Nagato, Yamaguchi, Prefecture in 130m.
21. East of Mishima, Yamaguchi Prefecture in 93m.
22. Wakasa Bay, Fukui Prefecture in 101m.
23. North of Noto Peninsula, Ishikawa Prefecture in 132m.
24. Toyama Bay, Toyama Prefecture in 135m.
25. West of Lake Jyûsangata, Aomori Prefecture in 115m.
26. Tsuruga Strait, Aomori Prefecture in 44, 108m.

Tymolus uncifer (ORTMANN), found in depths of 50-300m. on muddy bottoms.

1. South of Shiriya-zaki, Aomori Prefecture in 55m.
2. Between Todo-saki, Iwate Prefecture and Kinkazan, Miyagi Prefecture in 141, 177m.
3. North of Kinkazan, Miyagi Prefecture in 106, 123m.
4. South of Kinkazan, Miyagi Prefecture in 146m.
5. East of Shioya-saki, Fukushima Prefecture in 104, 132, 201m.
6. Between Shioya-saki and Inubô-zaki, Chiba Prefecture in 102, 124, 141m.
7. Inubô-saki, Chiba Prefecture in 95m.
8. Sagami Bay, Kanagawa Prefecture in 135, 170, 452m.
9. Kii Strait, east of Shikoku in 128-159m.
10. North of Ashizuri-saki, Kôchi Prefecture in 348m.
11. South of Koshiki Isls. in 243m.
12. North of Noto, Ishikawa Prefecture, Japan Sea in 123m.

Other records are:—Sansibar Kanal, Lat. 5°27'.4 S., Long. 39°18'.8 E. in 463m. East African coast, Lat. 0°27'.4 S., Long. 42° 47'.3 E. in 638m., Andaman, in 400-800m (DOPLEIN, 1904, p. 35).

Remarks:—The fossil species herein described may be a juvenile specimen of the *Dorippe*. The subfamily *Dorippinae* and *Tymolinae* are divided as follows.

	<i>Dorippinae</i>	<i>Tymolinae</i>
external maxillipeds	not long, incompletely cover the buccal cavern.	long, almost completely cover the buccal cavern.
afferent branchial openings	situated either immediately or shortly in front of the chelipeds.	may or may not be situated near the base of the cheliped.

Such critical parts as above listed can not be seen in the fossil specimen, which is similar also to the genus *Ethusa* of the *Dorippinae*.

Ethusa and *Tymolus* are distinguished from each other by the following feature. The front of *Tymolus* is provided with four teeth while that of *Tymolus* is entire, bidentate or four-dentate.

The shape of the carapace is more subglobose in *Tymolus*. *Tymolus kamadai* is similar to *Tymolus japonicus*, but can be distinguished by the proto-gastric region and number of and position of the pustules.

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