

Revision of the Eelpout Genus *Derjuginia*

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Abstract Two rare zoarcids, *Derjuginia ochotensis* and *Gengea japonica*, are reported from the Okhotsk and Japan Seas. They are separable by dorsal rays (98~110 vs. 90~94, respectively) and the relative position of the dorsal fin origin (advanced with anal origin below dorsal rays 7~10 vs. more posterior with anal origin below dorsal rays 1~3, respectively). *Gengea* is considered a synonym of *Derjuginia*.

Participating in an investigation of demersal fishes of the Okhotsk Sea performed by the Hokkaido Regional Fisheries Research Laboratory and Hokkaido Fisheries Experimental Station at Wakkanai, the author obtained two rare species of Zoarcidae: *Derjuginia ochotensis* Popov, 1931 and *Gengea japonica* Katayama, 1943. The relationships of these two species have never been examined, although they closely resemble each other in general appearance. A detailed comparison makes it clear that the differences between them are not of generic significance and *Gengea* is considered a synonym of *Derjuginia*. Descriptions of *Derjuginia* and of the two species, together with a key, are presented below, based upon the literature and the new materials.

The specimens examined in the present study are deposited in the Laboratory of Marine Zoology, Hokkaido University (HUMZ) and the Faculty of Agriculture, Kyoto University (FAKU). Counts and measurements follow those of Hubbs and Lagler (1958). Vertical fin rays and vertebrae were counted from radiographs.

Genus *Derjuginia* Popov, 1931

Derjuginia Popov, 1931: 137, type species (by monotypy), *Derjuginia ochotensis* Popov, 1931; Schmidt, 1950: 125.

Gengea Katayama, 1943: 101, type species (by monotypy), *Gengea japonica* Katayama, 1943; Matsubara, 1955: 781; Fowler, 1958: 319.

Description. Body covered with small cycloid scales, on trunk region sparsely distributed; head scaleless. Lateral line mediolateral. Gill opening small, never reaching lower base of pectoral fin. Jaws, vomer and palatines toothed. Dorsal

fin originates behind tip of pectoral fin. Pelvic fin absent. Branchiostegals 5.

Key to species of *Derjuginia*

- A1. Dorsal fin inserted clearly anterior to anal fin origin, the latter being below dorsal rays 7~10; dorsal 98~110; predorsal length 4.2~4.6 in total length. *D. ochotensis*
- A2. Dorsal fin inserted just above or a little anterior to anal fin origin; the latter being below dorsal rays 1~3; dorsal 90~94; predorsal length 3.2~3.4 in total length. *D. japonica*

Derjuginia ochotensis Popov, 1931
(Japanese name: Okhotsk-geuge)

(Fig. 1 A, C, D)

Derjuginia ochotensis Popov, 1931: 137, fig. 1 (northern Okhotsk Sea); Schmidt, 1950: 125 (northern Okhotsk Sea).

Specimens examined. HUMZ 55520 (190.4 mm TL, female), 60°01'N, 159°19'E, Okhotsk Sea, 120 m in depth, June 6, 1976; HUMZ 57963 (208.8 mm TL, female), 55°32'N, 138°08'E, Okhotsk Sea, 85 m, September 7, 1976; HUMZ 60360 (211.0 mm TL, female), HUMZ 60361 (219.5 mm TL, male), 56°37'N, 143°35'E, Okhotsk Sea, 240 m, September 22, 1976.

Description. Counts and proportional measurements are shown in Table 1.

Body elongate, cylindrical in anterior half and compressed posteriorly. Scales well developed on posterior half of body, becoming scattered and disappearing anterior to origin of anal fin; absent along anterior 1/3 to 1/2 of base of anal fin, on belly, body anterior to dorsal fin, and on head. Head moderately large. Snout

Table 1. Counts and measurements of *Derjuginia ochotensis* and *D. japonica*, based on new materials and the literature.

| Characters | <i>D. ochotensis</i> | | | | <i>D. japonica</i> | | | |
|--------------------------|----------------------|-------|----------------|---------------------|--------------------|-----------------|---------------------|-----------|
| | Popov (1931) | | Schmidt (1950) | Present specimens | | Katayama (1943) | Present specimens | |
| Measurements: | | | | | | | | |
| Total length (mm) | 110 | | | 190.4~219.5 | | 214 | 148.6~210.4 | |
| Standard length (mm) | — | | 110~239 | 189.4~217.1 | | — | 146.6~207.4 | |
| No. of specimens | 1 | | 3 | 4 | | 1 | 12 | |
| | In TL: | % SL: | % SL: | In TL: | % SL: | In TL: | In TL: | % SL: |
| Head length | 7.53 | 13.27 | 14.5~16.7 | 6.42~7.28 | 13.82~14.00 | 6.48 | 6.87~8.26 | 12.1~14.4 |
| Snout to anal-fin origin | 3.38 | 29.55 | 30.5~33.0 | 3.15~3.46 | 29.16~31.70 | 3.24 | 3.08~3.44 | 29.0~32.5 |
| Predorsal length | 4.37 | 22.91 | 22.5~27.6 | 4.17~4.56 | 22.00~24.12 | — | 3.17~3.44 | 29.0~31.5 |
| Depth of body | 14.47 | 6.91 | 5.5~7.5 | 11.09~13.60 | 7.40~8.77 | 11.88 | 13.41~16.88 | 5.9~7.5 |
| | In HL: | % HL: | % HL: | In HL: | % HL: | In HL: | % HL: | In HL: |
| Pectoral fin length | 1.92 | 52.05 | — | 1.86~2.43 | 41.20~53.82 | 2.27 | 1.84~2.28 | 43.8~54.7 |
| Interorbital width | 29.2 | 3.42 | 4.7~7.5 | 5.34~9.06 | 11.03~16.70 | 9.42 | 5.04~7.62 | 13.1~15.2 |
| Snout length | 7.30 | 13.70 | 15.6~19.1 | 5.52~8.09 | 12.40~16.70 | 5.50 | 4.71~7.14 | 14.0~21.2 |
| Eye diameter | 2.86 | 34.93 | 21.4~34.4 | 3.30~3.93 | 26.20~30.34 | 4.40 | 3.58~4.16 | 24.0~27.9 |
| Counts: | | | | | | | | |
| Dorsal rays | 110 | | 105~110 | 98~99 | | 93 | 90~94 | |
| Anal rays | 98 | | 83~95 | 92~94 | | 89 | 89~93 | |
| Pectoral rays | 13 | | 12~13 | 11 | | 11 | 10~11 | |
| Vertebrae | — | | — | 18~19+90~92=108~111 | | — | 17~18+91~94=108~112 | |

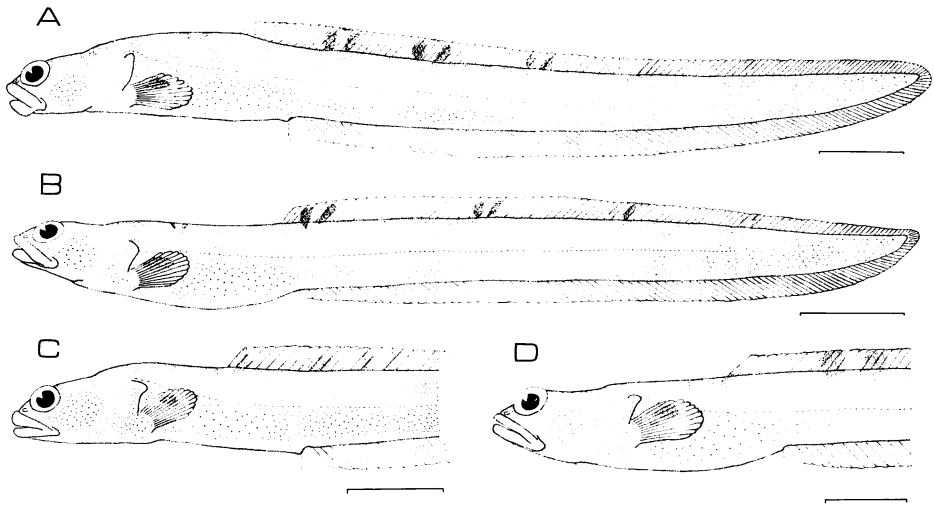


Fig. 1. *Derjuginia ochotensis* (A, C, D) and *D. japonica* (B) showing the origin of the dorsal fin and the position of blotches. Scale bars indicate 20 mm. A, HUMZ 60360 (211.0 mm TL, female); B, HUMZ 53327 (173.0 mm TL, female); C, HUMZ 55520 (190.4 mm TL, female); D, HUMZ 60361 (219.5 mm TL, male).

very short and blunt. Posterior end of upper jaw below posterior half of eye (Fig. 1D). In males, upper jaw sometimes extending beyond posterior margin of eye. Eye round and much longer than snout. Interorbital space narrow. Gill opening small, its lower end reaching only upper half of pectoral base. Gill rakers on first arch conical. A small slit behind last gill arch. Pseudobranchia present. Palatine membrane developed. Teeth small and conical; those on upper jaw in 4 or 5 irregular rows anteriorly, in a single row laterally; those on lower jaw in 4 irregular rows anteriorly, 1~3 irregular rows laterally; vomer with a group of 11~15 teeth; palatines with a single row of 15~21 teeth on each side. Lateral line mediolateral. Head pores well developed; nasal pores 2, interorbital pore 1, infraorbital pores 7 or 8, postorbital pores 3 or 4, occipital pores 2 or 3, preopercular pores 4, and mandibular pores 2. Vertical fins continuous and very low. Dorsal fin originates anterior to vertical through midpoint between posterior end of pectoral fin and origin of anal fin. Anal fin originates below 7th~10th dorsal rays. Caudal fin vestigial. Pectoral fin fan-like, moderately long, about half of head length.

Color of fresh specimens: Yellowish, with 5~7 short white bands interposed between black blotches on back and dorsal fin, the first

usually anterior to dorsal fin origin (Fig. 1A, C, D). A black blotch on upper half of pectoral fin. Ventral side of head, oral and gill cavities, and peritoneum light.

Derjuginia japonica (Katayama, 1943)

(Japanese name: Nirami-gege)

(Fig. 1B)

Gengea japonica Katayama, 1943: 101, fig. 1 (off Moroyose); Katayama, 1949: 77 (Toyama Bay); Matsubara, 1955: 781, fig. 297 (off Tsuiyama, Toyama Bay, off Niigata and Fukui Prefectures); Mori, 1956: 22 (coast of San-in District); Fowler, 1958: 319; Honma, 1963: 8 (off Sado Island); Takegawa and Morino, 1970: 383 (Wakasa Bay); Lindberg and Krasnyukova, 1975: 180, fig. 143.

Specimens examined. FAKU 1205 (210.4 mm TL, male), off Niigata Prefecture, Sea of Japan, during January to February, 1950; FAKU 12762 (183.6 mm TL, male) Toyama Bay, Sea of Japan, June 16, 1950; FAKU 13139 (183.4 mm TL, female), FAKU 13141 (201.8 mm TL, male), FAKU 13143 (187.8 mm TL, female), FAKU 13144 (160.3 mm TL, female), FAKU 13145 (148.6 mm TL, male), FAKU 13146 (180.2 mm TL, male), FAKU 13147 (179.1 mm TL, male), FAKU 13148 (200.0 mm TL, fe-

male), FAKU 13149 (188.0 mm TL, female), off Uozu, Sea of Japan, June, 1950; HUMZ 53327 (173.0 mm TL, female), 45°22'N, 143°30'E Okhotsk Sea, 160 m in depth, June 1, 1976.

Description. Counts and proportional measurements are shown in Table 1.

Body elongate and cylindrical anteriorly. Head somewhat widened by expansion of cheek muscles. Snout short and usually shorter than eye. Mouth moderately large, maxillary extending to below posterior half of eye. Eye round. Interorbital space very narrow. Gill opening small, extending ventrally to upper half of pectoral base. Gill rakers on first arch conical. A small slit behind last gill arch. Pseudobranchia present. Teeth very small and conical; those on upper jaw in 2 irregular rows anteriorly and in a single row laterally; those on lower jaw in 3 irregular rows anteriorly, in 2 rows anterolaterally and in a single row posteriorly; vomer with a group of 14 teeth; palatines with a single row of 9 teeth on each side. Head pores well developed; nasal pores 2, interorbital pore 1, infraorbital pores 6, post-orbital pores 3, preopercular pores 4, mandibular pores 2, and occipital pore 1. Dorsal fin originates just above or a little before origin of anal fin (Fig. 1B). Anal fin originates below 1st~3rd dorsal rays. Pectoral fin fan-like and moderately long.

Color of fresh specimens: Yellowish, with 5 white bands interposed between dark blotches on back and dorsal fin, the first anterior to dorsal origin (according to Katayama (1943), two white bands before dorsal origin). A black blotch on upper half of pectoral fin. Other parts of body light or yellowish.

Discussion

The genus *Derjuginia* was established by Popov (1931) based on *D. ochotensis* from the northern part of the Okhotsk Sea. Subsequently, Katayama (1943) described *Gengea japonica* from off Moroyose in the Sea of Japan without referring to the description of *D. ochotensis*, although they closely resemble each other.

A comparison of these two species makes it clear that *D. ochotensis* has a shorter predorsal length (4.2~4.6 in total length vs. 3.2~3.4 in *G. japonica*) and more dorsal rays (98~110 vs. 90~94) (Table 1, Figs. 1, 2). There are no other

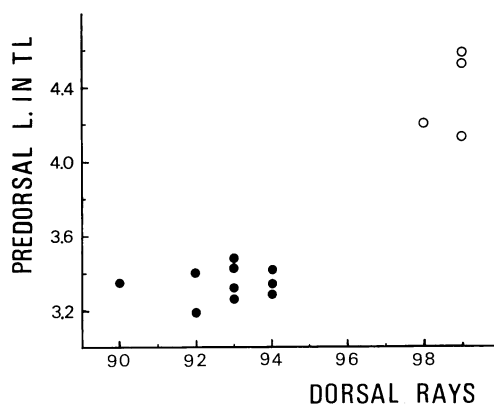


Fig. 2. Relationships of the predorsal length and numbers of dorsal rays in *Derjuginia japonica* (closed circle) and *D. ochotensis* (open circle).

clear differences between them. Such relatively small differences in ray numbers and position of the fin origin do not seem of sufficient importance for the separation of two genera, although they serve to distinguish the species. The genus, *Gengea*, therefore, is regarded as a synonym of *Derjuginia*.

Derjuginia japonica has been recorded from the coast of the Sea of Japan, ranging from Toyama Bay to San-in District. Its range is now extended north to the Okhotsk coast of Japan.

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オホーツクゲンゲ属の再検討

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オホーツク海の底魚資源調査によりオホーツクゲンゲ *Derjuginia ochotensis* およびニラミゲンゲ *Genge japonica* の2種が得られた。これら2種は非常によく似ているにもかかわらず、別属として記載され、その分類学上の関係についても論じられることがなかった。

本研究の結果、これら2種は背鰭前長および背鰭条数により区別できることが判明した。ところが、これらの形質は2種を分けるのには有効であるが、別属とする根拠とはならない。したがってニラミゲンゲ属はオホーツクゲンゲ属のシノニムであり、ニラミゲンゲは *Derjuginia japonica* (Katayama) となる。その結果、オホーツクゲンゲ属には、オホーツクゲンゲとニラミゲンゲの2種が含まれることになる。

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