Ruthenica, 2022, vol. 32, No. 3: 111-114.
Published online July 1, 2022.

http: ruthenica.net

Chiton lindholmii Schrenck, 1862 (Mollusca: Polyplacophora) is a junior synonym of *Stenoplax magdalenensis* (Hinds, 1845)

B.I. SIRENKO[1], H. SAITO[2]

[1]*Zoological Institute, Russian Academy of Sciences, St. Petersburg 199034, RUSSIA. E-mail: marine@zin.ru*
[2]*Department of Zoology, National Museum of Nature and Science, Tsukuba, Ibaraki 305-0005, JAPAN. E-mail: h-saito@kahaku.go.jp*

ABSTRACT. It is proposed to exclude *Stenoplax lindholmii* from the list of Japanese chiton species, which turned out to be a junior synonym of *S. magdalenensis*. Lectotype of *Chiton lindholmii* is designated.

https://doi.org/10.35885/ruthenica.2022.32(3).3

Chiton lindholmii Schrenck, 1862 (Mollusca: Polyplacophora) – младший синоним *Stenoplax magdalenensis* (Hinds, 1845)

Б.И. СИРЕНКО[1], Х. САЙТО[2]

[1]*Зоологический институт Российской Академии наук, Университетская наб. 1, Санкт Петербург, 199034, РОССИЯ. E-mail: marine@zin.ru*

[2]*Департамент зоологии Национального музея природы и науки, Цукуба, Ибараки 305-0005, ЯПОНИЯ. E-mail: h-saito@kahaku.go.jp*

РЕЗЮМЕ. Предлагается исключить из списка видов хитонов Японии *Stenoplax lindholmii,* который оказался младшим синонимом *S. magdalenensis*. Обозначен лектотип *Chiton lindholmii.*

Introduction

Schrenck [1862] initially described *Chiton lindholmii* Schrenck and *Chiton albrechtii* Schrenck in 1862. In 1867 he presented more detailed descriptions and images of these species and of six other chiton species [Schrenck, 1867]. Part of the material (*Chiton middendorffii* Schrenck, 1861 and *Chiton submarmoreus* Middendorff, 1847) was collected by him in the De Castries Bay, Strait of Tartary during the Imperial Russian Geographical Society expedition to the Amur Region and Sakhalin of 1854–1856. Dr. Albrecht and Captain Lindholm provided Schrenck the material from Hakodate Bay, Hokkaido Island, Japan (*Chiton zelandicus* Quoy et Gaimard, 1835, *Chiton spiniger* Sowerby, 1840, *Chiton coreanicus* Reeve, 1847, *Chiton lindholmii*, *Chiton albrechtii* and more *Chiton submarmoreus*). Schrenck also discussed the distribution of *Chiton stelleri* Middendorff, 1847 near Kodiak Island, Alaska and in the Sea of Japan. The collection of the Zoological Institute of Russian Academy of Sciences (ZIN) contains five of the eight species mentioned above, with the exception of *C. stelleri*, *C. zelandicus* and *C. coreanicus.* The type specimens of the three new species described by Schrenck, as well as the mentioned material of *C. spiniger* and *C. submarmoreus*, were preserved. Analysis of the last two species showed that the collection locations on the labels are incorrect. *C. spiniger,* is a junior synonym of *Acanthopleura gemmata* (Blainville, 1825), and the northernmost finds of this species were made near the southern islands of Japan [Kaas et al., 2006]. The second species, *C. submarmoreus* turned out to be *Boreochiton granulatus* (Jakovleva, 1952), and was later found in Mutsu Bay [Taki, 1938] and De Castries Bay [Sirenko *et al.*, 1988].

Of the three new species described by Schrenck, only *Stenoplax lindholmii* is uncertain. This species does not appear in the description of the genus *Stenoplax* by Isao and Iwao Taki [1931]. It is also not included in the lists of marine molluscs of Hokkaido and the molluscs of Japan [Kuroda, Kinoshita, 1951; Taki Is., 1954a; Murakami, 1989]. After the original description, this species first appeared in Pilsbry [1892] as *Ischnochiton* (*Trachyradsia*) *lindholmi* and then in Pilsbry [1895]; Thiele [1909]; and Taki Is.[1938] as the genus or subgenus *Stenoradsia* Carpenter MS, Dall,1879. However, later Taki Is. [1954b] named this species *Ischnochiton (Ischnoradsia) lindholmi* and Japanese authors continued to use this name until 1993 [Taki Is., 1961, 1962; Taki Iw., 1964; Higo, 1972; Higo, Goto, 1993a]. Not until 1980 did this species begin to appear in European, and later in Japanese, catalogs and monographs as

FIG. 1. Original label to *Chiton lindholmii*.

РИС. 1. Оригинальная этикетка к *Chiton lindholmii*.

Stenoplax (Stenoradsia) lindholmii [Kaas, Van Belle, 1980, 1987, 1998; Higo, Goto, 1993b; Higo *et al.*, 1999]. Despite the fact that this species appeared again in scientific literature, a wary attitude toward it remains. It is alarming that over the last 150 years, this large chiton has never been found again.

Material and methods

Lectotype of *Chiton lindholmii* (ZIN 45) (herein designated), two specimens of *Stenoplax magdalenensis* (Hinds, 1845) (ZIN 459) from Punta Abreojos, Baja California, intertidal, 4–5 April 1961, leg A.G. Smith have been examined. The valves of the type specimen, as well as the dorsal side of one specimen of *S. magdalenensis* with body length 63.0 mm were photographed by a Nicon G9 camera. Isolated perinotum scales of *C. lindholmii* were photographed with a scanning electron microscope.

Abbreviations: BL, body length. **IEE RAS**, A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia. **NSMT,** National Museum of Nature and Science, Tsukuba. **ZIN,** Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia.

Results.

We compared morphological features of the shell valves and girdle dorsal scales of the type specimen of *Chiton lindholmii* (Figs 2,3) with those of other species of the genus *Stenoplax*. We found that the examined characteristics are identical to the features of the species *Stenoplax magdalenensis*, which lives near Baja California and in the Gulf of California [Kaas, Van Belle, 1987]. Thus, we have established that *Chiton lindholmii* is a junior synonym of *S. magdalenensis*. The origin of this single collected chiton specimen still needs to be determined. To do this, we used Wikipedia (https://en.wikipedia.org/wiki/Otto_Wilhelm_Lindholm) to follow the journey of Captain Lindholm in the northern Pacific in 1850–1860. Otto Wilhelm Lindholm was a Finnish businessman who hunted whales. Between September 1857 and August 1861 he worked in the lagoons of Baja California. Beginning in 1862, he was hunting whales in the southern and southwestern parts of the Sea of Okhotsk, where he visited Hakodate Bay to hire Japanese. Judging by the time of Schrenck's description of the new species, the type specimen was transferred to St. Petersburg between 1861 and 1862, that is, after Lindberg's sailing from Baja California. From this time on, various collectors sent Schrenck many collections of molluscs, mainly from Hakodate Bay and the Tatar Strait (Lindholm, Albrecht, Nordmann, Gorchkewitsch, Maximovich) [Schrenck, 1867].

Probably the original labels of some of these samples were mixed up, so the specimen labeled as collected in Hakodate (Fig. 1) turned out to be from California. We can confirm our assumption by the following facts: collections described by Schrenck [1867], in addition to chitons, contained more than 50 species of gastropods. Although the majority of species were actually collected in Hakodate, several species were of questionable origin: e.g., *Trochus nordmani* Schrenck, 1863; *Trochus globularius* Schrenck, 1863 and *Voluta pusilla* Schrenck, 1862 described by Schrenck to be from Hakodate are not found in Japan. Several tropical species (*Terebra fulgurata* Philippi, 1846; *Oliva gracilis* Broderip & Sowerby, 1829; *Oliva dama* Wood, 1828; *Oliva anazora* Duclos, 1825; *Oliva tergina* Duclos, 1825) that inhabit the coast of Mexico were reported to be from the cold waters of the Tatar Strait. Tropical *Mitra microzonias* Lamarck, 1811 from the Indian Ocean was labeled to be from Hakodate Bay. Finally, several tropical species (*Cypraea mauritiana* Linnaeus, 1758; *C. caputserpentis* Linnaeus, 1758; *C. moneta* Linnaeus, 1758; *Pterocera bryonia* Gmelin, 1791; *Strombus japonicus* Reeve, 1851) also were labeled to be from Hakodate or the Tatar Strait, although they are actually known to be from much further south in Japan [Okutani, 2000].

Acknowledgements

We are very grateful to Enrico Schwabe (Zoologische Staatssammlung München, Germany) and Yuri Kantor (IEE RAS) for their valuable comments, Kazunori Hasegawa (NSMT) for the information on distribution of gastropods described by Schrenck in 1867, Mihael Blikshteyn (Portland, Oregon, USA) for polishing the English, Stanislav Iliutkin (ZIN) for his technical assistance with SEM procedures and Liza Malashicheva (Saint Petersburg State University of Veterinary Medicine), who prepared the digital plates. Scientific research were performed using equipment of the

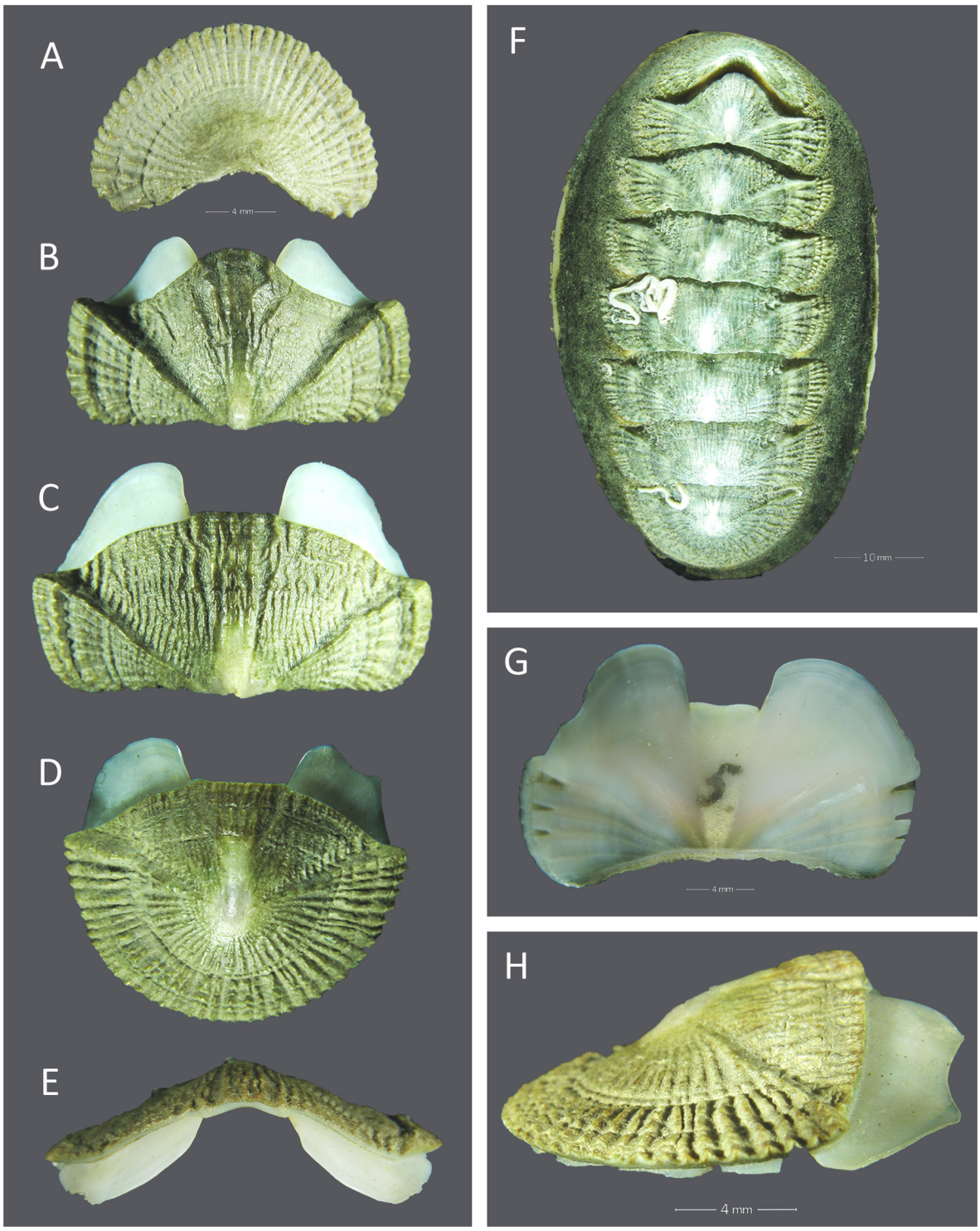

FIG. 2. *Chiton lindholmii*, lectotype (ZIN 45), BL 44.0 mm (A–E, G, H) and *Stenoplax magdalenensis*, Punta Abreojos, Baja California, intertidal, BL 63.0 mm (ZIN 453) leg A.G. Smith, 4–5 04.1961 (F). **A**. Head valve, dorsal view; **B**. Valve II, dorsal view; **C.** Valve IV, dorsal view; **D.** Valve VIII, dorsal view; **E**. Valve IV, rostral view; **F.** Dorsal view; **G.** Valve V, ventral view; **H.** Valve VIII, lateral view.

РИС. 2. *Chiton lindholmii*, лектотип (ZIN 45), BL 44,0 мм (A–E, G, H) и *Stenoplax magdalenensis,* Пунта Абреос, Бага Калифорния, литораль, BL 63.0 мм (ZIN 453) собрал А.Г. Смит, 4–5 04.1961 (F). **A**. Головной щиток, вид сверху; **B.** Щиток II, вид сверху; **C.** Щиток IV, вид сверху: **D.** Щиток VIII, вид сверху; **E.** Щиток IV, вид спереди; **F**. Вид сверху; **G**. Щиток V, вид снизу; **H**. Щиток VIII, вид сбоку.

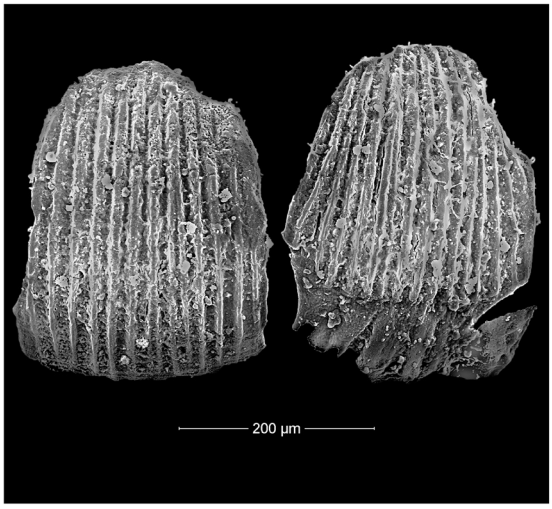

FIG. 3. *Chiton lindholmii*, lectotype (ZIN 45), dorsal scales.

РИС. 3. *Chiton lindholmii*, лектотип (ZIN 45), дорсальные чешуйки.

"Taxon" Research Resource Center (http://www.ckp-rf.ru/ckp/3038/) of the ZIN. This work was supported by the State scientific program "Taxonomy, biodiversity and ecology of invertebrates from Russian and adjacent waters of World ocean, continental water bodies and damped areas", N1021051402797-9.

References

Higo S. 1972. *A catalogue of molluscan fauna of the Japanese Islands and the adjacent area*. Biological Society of Nagasaki Prefecture, Nagasaki. 58+397+61 pp.

Higo S., Goto Y. 1993a. *A systematic list of molluscan shells from the Japanese Islands and the adjacent area.* Elle Scientific Publications, Osaka, 22+693+13+149 pp

Higo S., Goto Y. 1993b. *Correction & addition of systematic list (Polyplacophora).* Elle Scientific Publications, Osaka, 10 pp.

Higo S., Calomon P., Goto Y. 1999. *Catalogue and bibliography of the marine shell-bearing Mollusca of Japan. Gastropoda, Bivalvia, Polyplacophora, Scaphopoda*. Elle Scientific Publications, Osaka. 749 pp.

Kaas P., Van Belle R.A. 1980. *Catalogue of living chitons (Mollusca, Polyplacophora).* 1st Edition. Dr. W. Backhuys, Rotterdam, 204 pp.

Kaas P., Van Belle R.A. 1987. *Monograph of living chitons.* Vol. 3. *Suborder Ischnochitonina: Ischnochitonidae: Chaetopleurinae, and Ischnochitoninae*. E.J. Brill/W. Backhuys, Publisher, Leiden, 302 pp.

Kaas P., Van Belle R.A. 1998. *Catalogue of living chitons (Mollusca, Polyplacophora).* 2nd Revised Edition. Dr. W. Backhuys, Leiden, 204 pp.

Kuroda T., Kinoshita T. 1951. Icones of marine animals and plants of Hokkaido. Mollusca no. 1. A catalogue of marine molluscan shells of Hokkaido. *Bulletin of Hokkaido regional fisheries research laboratory*, 2. 1–40.

Murakami S. 1989. Distribution of Japanese living chitons. *Japanese Journal of Benthology,* 37: 65–71 [in Japanese].

Okutani T. (Ed.) 2000. *Marine Mollusks in Japan*. Tokai University Press, Tokyo, 1174 pp.

Pilsbry H.A. 1892–1894. *Monograph of the Polyplacophora.* In: Tryon, G.W. (Ed.) *Manual of Conchology*, Academy of Natural Sciences, Philadelphia, 14, 1–128, pls 1–30 (1892); i–xxxiv, 129–350, pls 31–68, 15, 1–64, pls 1–10 (1893); 65–133, pls 11–17 (1894).

Pilsbry H.A. 1895. *Catalogue of the marine mollusks of Japan, with description of new species and notes on others collected by Frederick Stearns*, Detroit, 196 pp.

Schrenck L. 1862. Vorläufige Diagnosen einiger neuer Gastropoden-Arten aus dem Nordjapanischen Meere. *Bulletin de l'Académie impériale des sciences de St.-Pétersbourg*, 5: 510–514.

Schrenck L. 1867. Reisen und Forschungen im Amurlande in den Jahren 1854-1856. 2(3) *Mollusken des Amurlandes und des Nordjapanischen Meeres. I. Spezieller Theil.1. Meeres-Mollusken. A, Gastropoda. 1, Chiton L*. St Petersburg: 271–291, pls 12–13.

Sirenko B.I., Buzhinskaya G.N., Gontar V.I., Potin V.V. 1988. To the fauna of the Chikhacheva Bay. In: Kafanov A.I. (Ed.). *Biota and communities of the Far Eastern Seas: lagoons and bays of Kamchatka and Sakhalin*. Westpac/10 C Program. Collection of scientific papers. Institute of Marine Biology, Academy of sciences of USSR, Far Eastern Branch, Vladivostok: 31–45.

Taki Is. 1938. Report on the biological survey of Mutsu Bay. 31. Studies on chitons of Mutsu Bay with general discussion on chitons of Japan. *Science reports of the Tohoku Imperial University*, Series 4. Biology 12: 323–423.

Taki Is. 1954a. Fauna of chitons around Japanese Islands, *Stenoplax* of Japan. *Bulletin of the National Science Museum (Tokyo)*, N.S. 1(2): 72–78, pls. 20–23.

Taki Is. 1954b. Polyplacophora from Japanese Islands. *Gloria Maris*, supplement no. 1: 1–13.

Taki Is. 1961. List of chitons from Japan. *Chiribotan,* 1(7/8) supplement: 1–8.

Taki Is. 1962. A list of the Polyplacophora from Japanese Islands and vicinity. *Venus*, 22(1): 29–53.

Taki Is., Taki Iw. 1931. Studies on Japanese chitons (5). *Venus*, 2(4): 178–185.

Taki Iw. 1964. Classification of the Class Polyplacophora, with a list of Japanese chitons. *Venus*, 22(4): 401–414.

Thiele J. 1909. Revision des Systems der Chitonen. II. Teil. Zoologica. *Original-Abhandlungen aus dem Gesamtgebiete der Zoologie*, *Stuttgart*, 22: 71–132.