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Kirkospira, a New Silurian Gastropod from Glacier Bay, Southeastern Alaska

By David M. Rohr and Robert B. Blodgett

Abstract

Kirkospira glacialis n.gen., n.sp., is described from the Upper Silurian part of the Willoughby Limestone of Glacier Bay, southeastern Alaska. The examined material, which was collected by two U.S. Geological Survey geologists, F.E. Wright in 1906 and Edwin Kirk in 1917, from one of two small islands situated immediately northeast of Willoughby Island, is part of a large-shelled molluscan facies that is observed on both Willoughby and Drake Islands. This fauna of the Alexander terrane is biogeographically most closely allied to other Late Silurian faunas known from the Ural Mountains of Russia and the Farewell terrane of southwestern Alaska.

Introduction

The Willoughby Limestone was named by Rossman (1963) for exposures on Willoughby Island, where the best and most typical section is situated. Kirk (1927b) considered the strata exposed there to be Late Silurian. Although Gryc and others (1967) modified the age to Middle Devonian, subsequent workers, such as Churkin (1973) and Soja and others (2000), retain Silurian and Late Silurian ages, respectively.

F.E. Wright and Edwin Kirk of the U.S. Geological Survey (USGS) collected a Silurian fauna, including gastropods, from Drake and Willoughby Islands in southeastern Alaska during 1906 and 1917, respectively. Descriptions of the bivalve genus *Pycnodesma* Kirk, 1927b, (subsequently renamed *Pycinodesma*, Kirk, 1927a) and the gastropod genus *Bathmopterus* Kirk, 1928 (=*Euomphalopterus* Fischer, 1887) were published in subsequent years.

The specimens described here were collected by F.E. Wright in 1906 and by Edwin Kirk in 1917. They bear the respective labels "873, Glacier Bay, small island 500′ east of Willoughby Island, Alaska" and "993, Small island lying off northeast end of Willoughby Island, Glacier Bay, Alaska" (two islands lying off the northeast end of Willoughby Island, fig. 1). The numbers "873" and "993" refer to their catalog number in the USGS Silurian-Devonian locality register. Examination of Kirk's collection indicates that the species was part of a large-shelled molluscan assemblage which included *Euomphalopterus liratus* (Kirk, 1928), *Coelocaulus karlae* Rohr and others (in press), *Holopea* sp., and a large pleurotomaroid shell described here for the first time. Specimen numbers with a prefix of "USNM" are from the National Museum of Natural History, Washington, D.C., where the specimens are deposited. Enclosed in one gastropod shell is a large leperditiid ostracode. Soja and others (2000) reported this same molluscan fauna from Drake Island, where they are part of a carbonate lagoonal facies associated with a stromatolite reef. As noted by Blodgett and Rohr (1990, 1991), Silurian gastropods are poorly known from Alaska, and this chapter and the report by Rohr and others (in press) should provide a more detailed view of the gastropod fauna of that age from southern Alaska's accreted terranes.

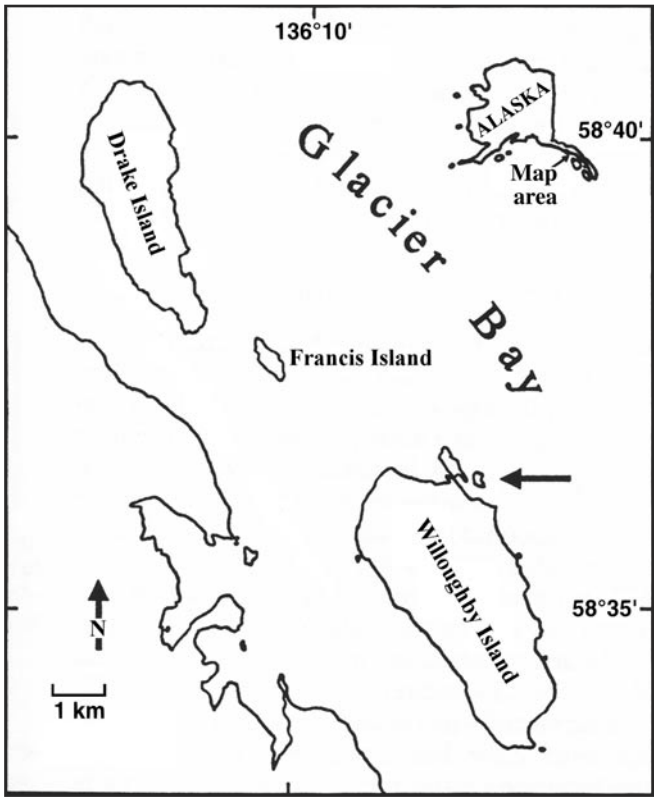

Figure 1. Glacier Bay, Alaska, showing location of Edwin Kirk's U.S. Geological Survey fossil locality 993–SD on a small island (arrow) northeast of Willoughby Island.

Paleobiogeographic Affinities of Silurian Faunas of the Alexander Terrane

In recent years, the concept that nearly all of Alaska, as well as much of the western Cordillera of North America, is composed of numerous discrete, accreted tectonostratigraphic terranes (Coney and others, 1980; Jones and others, 1981, 1982, 1986, 1987; Nokleberg and others, 1994) has gained general acceptance. Much of southeastern Alaska is considered part of the Alexander terrane. Despite having been better studied paleontologically than the rest of Alaska, the Alexander terrane of southeastern Alaska still remains relatively poorly known in comparison with cratonic North America. Nevertheless, the Silurian and Devonian shelly faunas of the Alexander terrane clearly demonstrate non-North American affinities and closer affinity with the Farewell terrane of southwestern Alaska, as well as with the Ural Mountains of Russia (Blodgett and others, in press). Although few faunal studies exist on Late Silurian gastropods from either Alaska or Russia, our limited data base indicates strong faunal ties between the gastropod faunas of the Alexander terrane with that of the Farewell terrane of southwestern Alaska (Rohr and others, in press) and the Ural Mountains (Chernyshev, 1893). Chernyshev focused on Early Devonian faunas of the Urals; however, the gastropod fauna particularly similar to the Late Silurian faunas of the Alexander and Farewell terranes is that reported from the Taltiya River (at the mouth of the Bobrovka), now considered to be of Ludlovian (middle Late Silurian) age (Melnikov and Khodalevich, 1965, p. 177).

The Late Silurian brachiopod fauna of the Alexander terrane shows its strongest affinity with that of the Ural Mountains of Russia, as is well demonstrated by the large distinctive pentamerid genera *Brooksina* Kirk, 1922, *Harpidium* Kirk, 1925, and *Cymbidium* Kirk, 1926, all based on specimens found in the Heceta Limestone in the area of Prince of Wales Island. These three genera occur together in one single collection, from USGS fossil locality 1005–SD in the Vermont Marble prospect on the south shore of Kosciusko Island (Kirk and Amsden, 1952, p. 53). In terms of overall brachiopod taxic composition, the faunal association from that locality closely matches the *Brooksina* Community of Sapelnikov and others (1999) on the basis of collections from the Lozva River, Ivdel region, east slope of the Northern Urals. As noted by Kirk and Amsden (1952, p. 54), the Heceta faunas most closely resemble Late Silurian faunas described by Khodalevich (1939) from the east slope of the Urals. The genus *Brooksina*, according to Sapelnikov (1985), is known from strata of late Wenlockian to Ludlovian age and occurs in both the east and west slopes of the Urals, Gornyi Altai, southern Tien Shan, Kazakhstan, and northeastern Siberia, as well as in Ludlovian strata of southeastern Alaska and Nevada (Johnson and others, 1976). The genus *Cymbidium*, according to Sapelnikov (1985), occurs in Ludlovian strata of southeastern Alaska and central Nevada and questionably in northeastern Siberia (the Omulevsk Mountains). The genus has also been recognized recently from Wenlockian strata on Baillie Hamilton Island, Canadian Arctic Islands (Zhang, 1989). The genus *Harpidium*, according to Sapelnikov (1985), ranges in age from late Llandoverian to Ludlovian and is much more widespread in distribution than the first two genera, occurring in the Urals, the Central Asia part of the former USSR, Kazakhstan, the Goryni Altai, northeastern USSR, southeastern Alaska, the midcontinental region of the United States (Iowa, Wisconsin, Ohio, and Illinois), and Greenland. The overall affinities of these three distinctive genera of the Alexander terrane remain closest to the Urals; although the genus *Cymbidium* has not been reported from there, it is reported questionably from the Kolyma region of Siberia.

As in the Farewell terrane, the Heceta Limestone of the Alexander terrane contains extensive buildups of Late Silurian algal-reef-mound complexes, containing an algal flora and associated sphinctozoan sponge complex known also in the Urals and the Farewell terrane (Riding and Soja, 1993; Soja and Riding, 1993; Rigby and others, 1994; Soja, 1994; Soja and Antoshkina, 1997; Soja and others, 2000). Similar buildups are unknown from nonaccreted rocks of equivalent age in North America.

Systematic Paleontology

Family PLETHOSPIRIDAE Wenz, 1938

Discussion.—In the classification of Wenz (1938), the subfamily Plethospiridae Wenz, 1938, was regarded as belonging to the Pleurotomarioidea. Knight and others (1960) transferred this subfamily and raised it in rank to a family within the superfamily Murchisonioidea Koken, 1896, without written explanation of evidence supporting this transferral.

KIRKOSPIRA n.gen.

Diagnosis.—Large, turbiniform gastropod with apical angle about 95°, extended narrowly phaneromphalous base, with thick, reflexed columellar lip. Selenizone above midwhorl, fine spiral ornamentation.

Type species.—*Kirkospira glacialis* n.sp.

Comparison.—The shell is similar in shape to *Phanerotrema* Fischer, 1885, but the selenizone is not as high on the whorl, and it lacks the ornamentation. The genus has a similar shape but has a less acute apical angle than *Plethospira* Ulrich in Ulrich and Scofield, 1897, and *Seelya* Ulrich in Ulrich and Scofield, 1897. The latter genera have been illustrated with inwardly reflexed columellar lips (Knight and others, 1960), but this feature is not shown well on the actual specimens (see Knight, 1941).

Etymology.—Genus named after Edwin Kirk, whose early studies of Alaskan fossils are the basis of this report.

Included species.—Only the type species.

Known stratigraphic range.—Late Silurian.

Known geographic range.—Southeastern Alaska (Alexander terrane)

***Kirkospira glacialis* n.sp.**
(Pl. 1, Figs. 2, 3)

Diagnosis.—By monotypy, same as the genus.

Holotype.—USNM specimen 520613. Paratypes USNM 520614–520617, both from USGS fossil locality 993–SD.

Etymology.—*glacialis*, Latin for ice, in reference to Glacier Bay, Alaska.

Description.—Relatively large (10 cm high), rounded gastropods with an apical angle of about 95° and a narrow, raised selenizone located above midwhorl. Whorl cross section rounded, rhombic, about twice as high as wide. Depth of sinus or slit unknown. Whorl surface curves convexly downward and outward from impressed suture to selenizone and then curves convexly downward and inward to meet columellar lip. Thick, outwardly reflexed columellar lip. Growth lines prosocline above selenizone and nearly orthocline below. Fine spiral ornamentation on some specimens. Cross sections show a deep, narrow umbilicus, possibly formed by the reflexed columella.

Discussion.—The description is based on 15 large, nonsilicified specimens that were separated from the limestone matrix by Edwin Kirk.

Occurrence.—USGS fossil localities 873–SD and 993–SD, "small island lying off northeast end of Willoughby Island, Glacier Bay, Alaska."

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PLATES 1, 2

Plate 1.

Figures 1–4. *Kirkospira glacialis* n.sp. from Upper Silurian part of the Willoughby Limestone.

1. Side view showing peripheral band above midwhorl. U.S. National Museum (USNM) paratype 520614. Magnification, ×1.
2. Detail of growth lines and fine, spiral threads. USNM paratype 520615. Magnification, ×2.
3. Side of view, ×1, showing shape of whorl and columellar lip. USNM holotype 520613. Magnification, ×1.
4. Side view of fragmentary specimen. USNM paratype 520616. Magnification, ×1.

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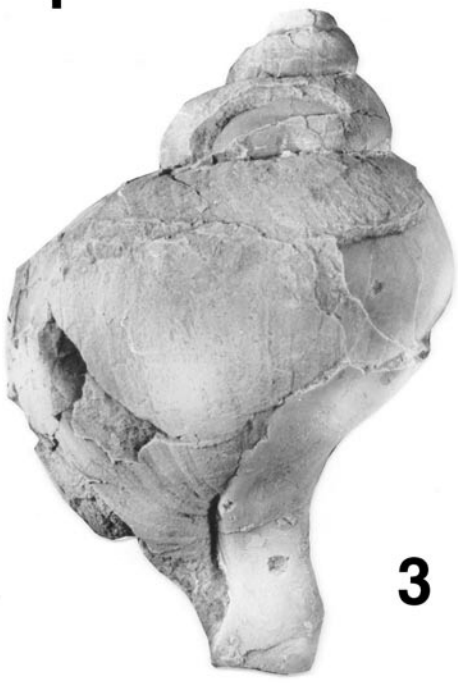

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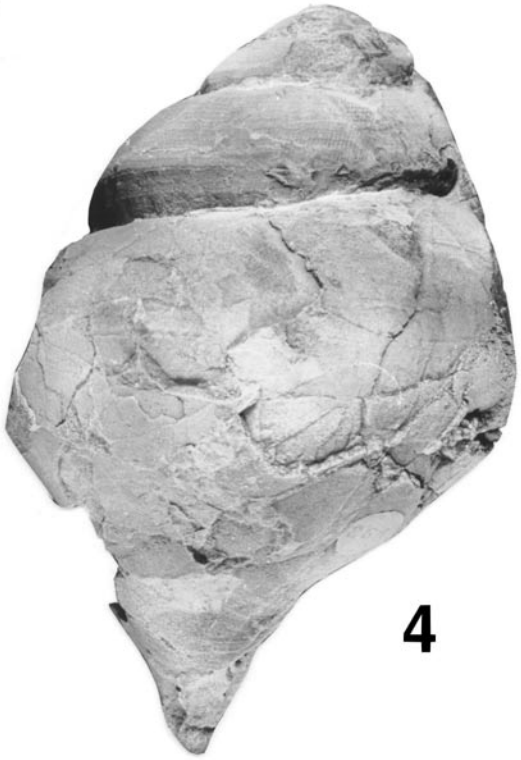

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Plate 2.

Kirkospira glacialis n.sp. at U.S. Geological Survey locality 993–SD. Upper Silurian part of the Willoughby Limestone. Cross-sectional views showing narrow umbilicus. USNM paratypes 520617a and 520617b. Magnification, ×1