

The Gastropod Fauna of Onagawa Bay, Northeastern Japan

著者	SASAKI Koichi
journal or publication title	Tohoku journal of agricultural research
volume	50
number	1/2
page range	23-32
year	1999-09-30
URL	http://hdl.handle.net/10097/30014

The Gastropod Fauna of Onagawa Bay, Northeastern Japan

Koichi SASAKI

*Laboratory of Fisheries Biology and Ecology, Graduate School of Agricultural Science,
Tohoku University, Sendai, Miyagi 981-8555 Japan*

(Received, June 30, 1999)

Summary

Gastropod species from Onagawa Bay, Miyagi, are listed. Specimens examined were collected from 1990 to 1998. They were categorized into 105 species in 77 genera and 39 families. The list includes the first record of two species in the area north of the Boso Peninsula: *Lamellaria kiiensis* (Lamellariidae) and *Proterato tomline* (Eratoidae). Gastropod species distributed widely along the coast of Japan accounted for 61.9% of the total number of species, and the proportions of southern and northern species were equal. The geographical distribution pattern of species composition is similar to that of the bivalve fauna of the bay.

Introduction

Onagawa Bay, Miyagi Prefecture, is north of the foot of the Oshika Peninsula, in the southernmost area of the Sanriku-ria coast (Fig. 1). Some oceanographic components coexist intricately off the bay: warm water currents and warm water masses in the mixing area which are influenced by the Kuroshio current, the Tsugaru warm current, and the branches of the Oyashio current. The relations between them vary both temporally and spatially, and thus, the conditions of the bay are seasonally affected by both cold and warm currents.

Various taxa of marine fauna in the bay have been investigated. Saito¹⁾ reported on chitons, and Sasaki²⁾ reported on bivalves. The latter showed that the bay had a transitional composition of both northern and southern species, owing to the oceanographic conditions.

This paper lists gastropod species from Onagawa Bay and its adjacent waters in the years from 1990 to 1998. The paper discusses the faunal characteristics, and includes notes on some species.

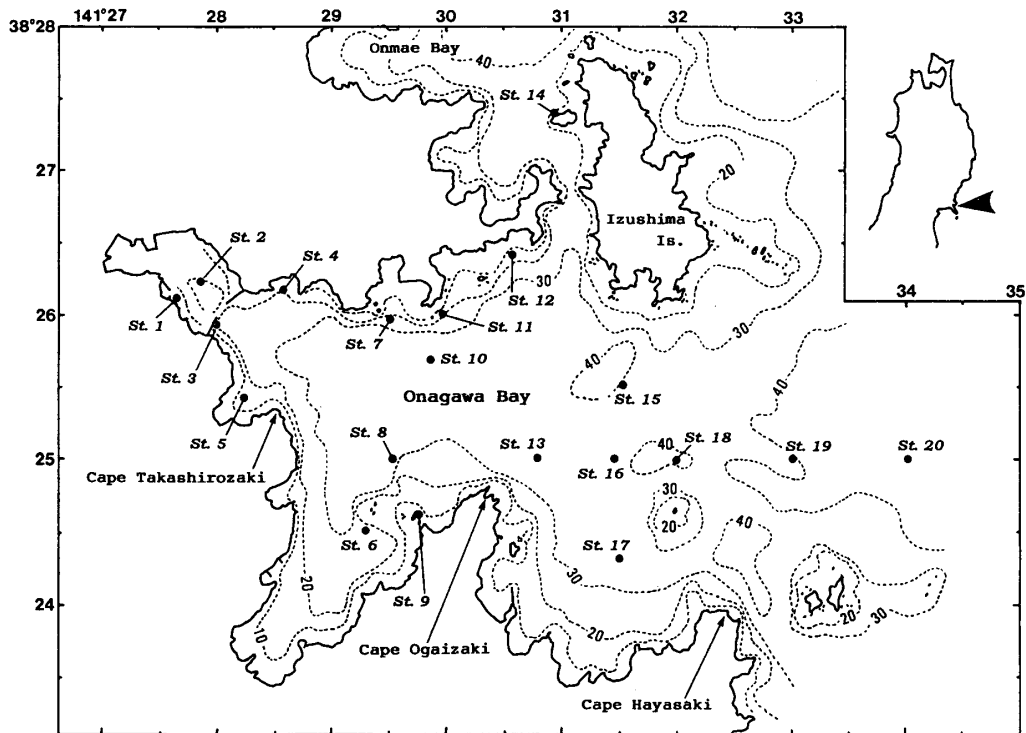


FIG. 1. Map of Onagawa Bay with bottom topography. Solid circles with numerals denote sampling stations.

Materials and Methods

The specimens examined were collected between May 1990 and April 1998. Figure 1 shows a map of Onagawa Bay with the bottom topography and sampling sites. Gastropods were collected by hand at Sts. 1, 3, 9, 11, and 14 in the intertidal zones of rocky shores, and at Sts. 6, 7, and 12 on floats and ropes of hanging-culture rafts. Small dredges and a Smith-McIntyre grab sampler were used for collection at the other stations.

Results and Discussion

Table 1 lists the gastropods found in Onagawa Bay and its adjacent waters, following the taxonomic nomenclature of Okutani³⁾. Each species is listed with its Japanese name, geographical distribution pattern, relative abundance in the bay, and stations at which the specimens were collected. The geographical distribution of species is classified into three types based on the ranges recorded by Habe⁴⁾, Habe and Kosuge⁵⁾, Okada *et al.*⁶⁾, and Okutani³⁾: [N] northern species distributed chiefly north of the Boso Peninsula, [S] southern species distributed mainly south of the peninsula, and [T] species commonly found throughout the waters around Japan, from the southern part of Hokkaido to

TABLE 1. *Gastropods collected in Onagawa Bay and its adjacent waters*

Subclass PROSOBRANCHIA

Order Archaeogastropoda

Family Haliotiidae

Haliotis discus hannai Ino, 1952

: ezoawabi, [N], common, Sts. 1, 9, 11

Family Fissurellidae

Tugali decussata A. Adams, 1852

: sirosusokakegai, [T], restricted, Sts. 8, 13, 16

Tugali (Tugalina) gigas (Martens, 1881)

: saruawabi, [N], common, Sts. 3, 9, 11

Puncturella nobilis A. Adams, 1851

: kôdakasukashigai, [N], common, Sts. 13, 16

Macroschisma sinense A. Adams, 1855

: sukashigai, [S], restricted, St. 14

Family Nacellidae

Cellana toreuma (Reeve, 1854)

: yomegakasagai, [T], very common, Sts. 6, 7, 12

Cellana grata (Gould, 1859)

: bekkôkasagai, [T], very common, Sts. 3, 6, 9, 11

Cellana nigrolineata (Reeve, 1839)

: matsubagai, [T], very common, Sts. 9, 12

Family Lottiidae

Patelloida saccharina lanx (Reeve, 1855)

: unoashigai, [T], common, Sts. 9, 12

Patelloida pygmaea (Dunker, 1860)

: himekozaragai, [T], common, Sts. 3, 6, 9

Niveotectura pallida (Gould, 1859)

: yukinokasagai, [N], very common, Sts. 3, 6, 9, 12

Lottia cassis (Eschscholtz, 1833)

: shirogai, [N], restricted, Sts. 9, 13

Lottia dorsuosa (Gould, 1859)

: kamogai, [T], common, Sts. 1, 3, 9

Lottia kogamogai Sasaki & Okutani, 1994

: kogamogai, [T], very common, Sts. 7, 9, 11, 12

Lottia langfordi (Habe, 1944)

: kikukozaragai, [T], restricted, Sts. 9, 12

Nipponacmea schrenckii (Lischke, 1868)

: aogai, [S], restricted, Sts. 9, 13

Nipponacmea concinna (Lischke, 1870)

: kôdakaogai, [T], common, Sts. 5, 13

Family Trochidae

TABLE 1. *Continued*

<i>Calliostoma (Tristichotrochus) multiliratum</i> (Sowerby, 1875)	: nishikiebisugai, [T], common, Sts. 3, 9
<i>Calliostoma (Tristichotrochus) unicus</i> (Dunker, 1860)	: ebisugai, [S], restricted, Sts. 1, 3
<i>Turcica coreensis</i> Pease, 1860	: makiageebisugai, [T], restricted, St. 19
<i>Ginebis argenteonitens hirasei</i> (Okuta & Taki, 1943)	: hirasegin-ebisugai, [T], restricted, Sts. 13, 16
<i>Monodonta labio</i> (Linnaeus, 1758)	: ishidatamigai, [T], very common, Sts. 1, 3, 9, 11
<i>Monodonta neritoides</i> (Philippi, 1850)	: kurozukegai, [T], restricted, St. 9
<i>Cantharidus callichroa</i> (Philippi, 1850)	hanachigusagai, [T], very common, Sts. 3, 9
<i>Cantharidus japonicus</i> (A. Adams, 1853)	: chigusagai, [T], common, Sts. 3, 9, 11
<i>Tegula (Chlorostoma) argyrostoma</i> (Gmelin, 1791)	: kubogai, [T], very common, Sts. 1, 10, 11
<i>Tegula (Omphalius) rusticus</i> (Gmelin, 1791)	: koshidakagangara, [T], common, Sts. 1, 3, 5
<i>Tegula (Omphalius) pfeifferi</i> (Philippi, 1846)	: bateira, [T], common, Sts. 9, 11
<i>Umbonium (Suchium) costatum</i> (Kiener, 1838)	: kisago, [T], restricted, St. 17
<i>Minolia subangulata</i> Koroda & Habe, 1952	: kadokoshidakashitadami, [T], rare, St. 20
<i>Lirularia mustelina</i> (Gould, 1861)	: awajichigusagai, [T], common, Sts. 3, 9, 11
Family Turbinidae	
<i>Homalopoma nocturnum</i> (Gould, 1861)	: sanshōgai, [T], common, Sts. 15, 18
<i>Homalopoma amussitatum</i> (Gould, 1861)	: ezosanshōgai, [N], common, Sts. 13, 16
<i>Homalopoma sangarense</i> (Schrenck, 1867)	: yamazanshōgai, [N], common, Sts. 8, 13
<i>Lunella coronata coreensis</i> (Récluz, 1853)	: sugai, [T], rare, St. 9
<i>Phasianella solida</i> (Born, 1780)	: sarasabai, [S], very common, Sts. 3, 10, 11
<i>Tricolia variabilis</i> (Pease, 1861)	: benibai, [T], restricted, St. 11

TABLE 1. *Continued*

Order Mesogastropoda

Family Littorinidae

Littorina brevicula (Philippi, 1844)

: tamakibigai, [T], very common, Sts. 1, 3, 7, 9, 11

Littorina (Neritrema) sitkana Philippi, 1846

: kurotamakibigai, [N], restricted, St. 13

Nodilittorina radiata (Eydoux & Souleyet, 1852)

: araretamakibigai, [T], very common, Sts. 3, 7, 9

Lacuna (Ephelia) decorata A. Adams, 1861

: kôdakachairotamakibigai, [N], common, Sts. 9, 11

Lacuna (Ephelia) turrita A. Adams, 1861

: chairotamakibigai, [N], common, Sts. 9, 11

Family Rissoidae

Alvania sadoensis (Yokoyama, 1927)

: sadotsubo, [S], very common, Sts. 3, 11

Rissoina (Phosinella) fusca Gould, 1861

: nunomechôjigai, [S], rare, St. 18

Family Barleeidae

Barleeia angustata (Pilsbry, 1901)

: chatsubo, [S], restricted, St. 11

Family Caecidae

Brochina glabella (A. Adams, 1868)

: mijintsutsugai, [T], very common, Sts. 8, 13, 16

Family Scaliolidae

Finella pupoides A. Adams, 1860

: sanagimotsubo, [T], common, Sts. 8, 13

Family Vermetidae

Serpulorbis imbricatus (Dunker, 1860)

: oohebigai, [T], restricted, Sts. 3, 11

Family Lamellariidae

Lamellaria kiiensis Habe, 1944

: kishûbekkôtamagai, [S], rare, St. 9

Family Naticidae

Glossaulax didyma (Roding, 1798)

: tsumetagai, [T], common, Sts. 9, 10, 18

Tanea sagittata (Menke, 1843)

: haginotsuyugai, [S], rare, St. 9

Cryptonatica janthostomoides (Kuroda & Habe, 1949)

: ezotamagai, [T], common, Sts. 8, 13, 16, 18

Family Eratoidae

Proterato tomlini Schilder, 1933

TABLE 1. *Continued*

	: shinzakurogai, [S], rare, St. 13
Family Ranellidae	
	<i>Fusitriton oregonensis</i> (Redfield, 1848)
	: ayabora, [N], very common, Sts. 2, 8, 13, 18
Family Tonnidae	
	<i>Tonna luteostoma</i> (Küster, 1857)
	: yatsushirogai, [T], common, Sts. 13, 16
Order Neogastropoda	
Family Muricidae	
	<i>Rapana bezoar</i> (Linnaeus, 1767)
	: chirimenbora, [T], common, Sts. 3, 11
	<i>Rapana venosa</i> (Valenchiennes, 1846)
	: akanishi, [T], restricted, St. 5
	<i>Boreotrophon candelabrum</i> (Reeve, 1848)
	: tsunooriiregai, [T], common, Sts. 8, 13, 16
	<i>Ceratostoma burnetti</i> (A. Adams & Reeve, 1850)
	: hiregai, [T], common, Sts. 2, 3
	<i>Ceratostoma fourrieri</i> (Crosse, 1861)
	: isobashôgai, [S], rare, St. 10
	<i>Ocenebra inornatam</i> (Dunker, 1860)
	: oouyôrakugai, [T], restricted, Sts. 8, 16
	<i>Thais (Reishia) bronni</i> (Dunker, 1860)
	: reishigai, [T], restricted, St. 11
	<i>Thais (Reishia) clavigera</i> (Küster, 1858)
	: ibonishi, [T], very common, Sts. 1, 3, 9
	<i>Nucella freycineti heyseana</i> (Dunker, 1882)
	: chijimibora, [N], common, Sts. 1, 3, 9
Family Buccinidae	
	<i>Japelion pericochlion</i> (Schrenck, 1865)
	: nejibora, [N], restricted, St. 19
	<i>Neptunea intersculpta</i> (Sowerby, 1899)
	: ezoboramodoki, [N], restricted, St. 15
	<i>Neptunea arthritica</i> (Bernardi, 1858)
	: himeezobora, [N], restricted, St. 19
	<i>Nassaria (Microfusis) acutispirata</i> (Sowerby, 1913)
	: himenishi, [S], rare, St. 8
	<i>Siphonalia spadicea</i> (Reeve, 1847)
	: mayutsukurigai, [T], common, Sts. 8, 10, 13, 16
	<i>Kelletia lischkei</i> Kuroda, 1938
	: migakibora, [S], restricted, St. 14
	<i>Searlesia fuscolabiata</i> (Smith, 1875)

TABLE 1. *Continued*

: ezoisonina (tobaisonina), [N], common, Sts. 8, 13, 16
<i>Volutharpa ampullacea perryi</i> (Jay, 1855)
: mosusogai, [T], very common, Sts. 2, 4
<i>Buccinum isaotakii</i> Kira, 1959
: shiraitomakibai, [N], rare, St. 18
Family Nassariidae
<i>Nassarius (Niotha) livescens</i> (Philippi, 1849)
: mushirogai, [T], common, Sts. 4, 5
<i>Nassarius (Niotha) festivus</i> (Powys, 1833)
: aramushirogai, [T], common, Sts. 4, 10
<i>Nassarius (Hima) multigranosus</i> (Dunker, 1847)
: himemushirogai, [T], common, Sts. 3, 5
<i>Nassarius (Hima) praematuratus</i> (Kuroda & Habe in Habe, 1960)
: kinubora, [T], rare, St. 13
<i>Nassarius (Zeuxis) castus</i> (Gould, 1850)
: hanamushirogai, [S], common, Sts. 5, 8
Family Columbelloidea
<i>Pyrene (Mitrella) bicincta</i> (Gould, 1860)
: mugigai, [T], common, Sts. 4, 8, 13
<i>Pyrene (Mitrella) burchardi</i> (Dunker, 1877)
: kôdakamatsumushigai, [T], common, Sts. 8, 13
Family Fasciolaridae
<i>Fusinus perplexus</i> (A. Adams, 1864)
: naganishi, [T], rare, St. 16
Family Olividae
<i>Olivella japonica</i> Pilsbry, 1895
: hotarugai, [T], common, Sts. 5, 8
Family Volutidae
<i>Fulgoraria (Musashia) provostiana</i> (Crosse, 1878)
: oohitachiobigai, [N], restricted, St. 13
Family Turridae
<i>Inquisitor jeffreysi</i> (Smith, 1875)
: momijibora, [T], common, Sts. 8, 13, 16, 18
<i>Suavodrillia declivis</i> (Martens, 1880)
: togarikudamakigai, [T], restricted, St. 16
<i>Clathurella (Etrempa) subauriformis</i> (Smith, 1879)
: nunomeshajikugai, [T], restricted, St. 13
Family Terebridae
<i>Terebra (Brevimyurella) japonica</i> (Smith, 1873)
: himetokusagai, [T], common, Sts. 13, 16
Order Heterogastropoda

TABLE 1. *Continued*

Family Epitoniidae
<i>Amaea thielei</i> (De Boury, 1913)
: kurin-itokakegai, [S], rare, St. 13
Subclass OPISTHOBRANCHIA
Order Entemotaeniata
Family Pyramidellidae
<i>Syrnola virgo</i> (A. Adams, 1860)
: migakikuchikiregai, [T], restricted, St. 15
<i>Leucotina diana</i> (A. Adams, 1855)
: makimonogai, [S], rare, St. 16
Order Cephalaspidea
Family Ringiculidae
<i>Ringicula (Ringiculina) doliaris</i> Gould, 1860
: mameurashimagai, [S], common, Sts. 10, 16
<i>Microglyphis japonicus</i> (Habe, 1952)
: warabemameurashimagai, [S], rare, St. 18
Family Retusidae
<i>Rhizorus radiola</i> (A. Adams, 1862)
: aomorimamehigai, [N], rare, St. 16
Family Atyidae
<i>Liloa porcellana</i> (Gould, 1859)
: kaikogaidamashi, [S], rare, St. 10
Family Philinidae
<i>Philine argentata</i> Gould, 1859
: kisewatagai, [T], very common, Sts. 8, 10, 13
Order Anaspidea
Family Aplysiidae
<i>Aplysia (Pruvotaplysia) parvula</i> Mörch, 1863
: kuroheriamefurashi, [T], restricted, Sts. 9, 11
<i>Aplysia (Varria) kurodai</i> (Baba, 1937)
: amefurashi, [T], common, Sts. 1, 5, 9, 11
<i>Aplysia (Aplysia) juliana</i> Quoy & Gaimard, 1832
: amakusaamefurashi, [T], common, Sts. 9, 11
Order Notaspidea
Family Pleurobranchaeidae
<i>Pleurobranchaea japonica</i> Thiele, 1925
: umifukurô, [T], restricted, St. 10
Order Doridacea
Family Dorididae
<i>Chromodoris orientalis</i> Rudman, 1983
: shiroumiushi, [T], restricted, Sts. 3, 7

TABLE 1. *Continued*

<i>Homoiodoris japonica</i> Bergh, 1881
: yamatoumiushi, [T], common, Sts. 7, 9, 10
Family Dendrodorididae
<i>Dendrodoris arborescens</i> (Collingwood, 1881)
: kuroshitanashiomiushi, [S], restricted, St. 7
Order Aeolidacea
Family Facelinidae
<i>Facelinella quadrilineata</i> (Baba, 1930)
: yotsusujiminoumiushi, [N], rare, St. 3
Family Aeolidiidae
<i>Aeolidiella indica</i> Bergh, 1888
: minoumiushi, [T], restricted, Sts. 3, 9
Subclass PULMONATA
Order Basommatophora
Family Shiphonariidae
<i>Shiphonaria (Sacculosiphonaria) japonica</i> (Donovan, 1834)
: karamatsugai, [T], common, Sts. 3, 13, 16

Kyushu. Relative species abundance in the bay is divided into four categories: very common, always found in large parts of the bay and relatively abundant; common, always found at some sites, but not abundant; restricted, sometimes collected in restricted areas, but small in number; and rare, collected only once in the study. Because the study combined data from various surveys that differed in their purposes and sampling methods, the definitions are approximate.

The gastropods collected in Onagawa Bay were categorized into 105 species in 77 genera and 39 families. This is the first record for *Lamellaria kiiensis* (Lamellariidae) and *Proterato tomline* (Eratoidae) from the area north of the Boso Peninsula. *Tegula (Omphalius) rusticus* and *T. (O.) pfeifferi* (Trochidae) are both common in rocky intertidal zones of the bay. The former is found chiefly in the inner part of the bay, the latter near the bay mouth. Although these two generally have different habitats, they partly overlap each other in the central part of the bay. Fisheries in the bay use only six gastropod species: *Haliotis discus hannai* (Haliotiidae), *Tegula argyrostoma*, *T. rusticus*, and *T. pfeifferi* (Trochidae), *Ceratostoma burnetti* (Muricidae), and *Volutharpa ampullacea perryi* (Buccinidae).

Table 2 shows the numbers of species for each relative abundance category. The bay has a high percentage of gastropod species found widely along the coast of Japan: type T accounted for 61.9% of the total number of species. The proportion of southern species (19.0%) to the total was equal to that of northern

TABLE 2. *Number of species in each relative abundance category. Numerals in parentheses denote percentage relative to the total number of species.*

Relative abundance category	Southern species [S]	Commonly found [T]	Northern species [N]
very common	1 (1.0)	13 (12.4)	2 (1.9)
common	3 (2.9)	30 (28.6)	9 (8.6)
restricted	6 (5.7)	18 (17.1)	6 (5.7)
rare	10 (9.5)	4 (3.8)	3 (2.9)
total	20 (19.0)	65 (61.9)	20 (19.0)

species. This species composition is also found in the bivalve fauna of the bay²⁾, which may reflect the mixing of warm and cold currents.

Acknowledgement

The author is greatly indebted to Dr. K. Hasegawa, Department of Zoology, National Science Museum, for his help in identifying species and for his valuable advice on scientific names to be adopted.

References

- 1) Saito, H.: The chiton fauna of Onagawa Bay, northeastern Honshu, Japan, *Mem. Natn. Sci. Mus., Tokyo*, (28), 99-112 (1995)
- 2) Sasaki, K.: The bivalve fauna of Onagawa Bay, Northeastern Japan, *Tohoku J. Agr. Res.*, 47, 47-57 (1996)
- 3) Okutani, T. (ed.): "*Illustrations of Animals and Plants-8. Mollusks*", Sekaibunka-sha, Tokyo, 1986, 339 p. (in Japanese)
- 4) Habe, T. (ed.): "*The Mollusks of Japan*", Gakushu-kenkyu-sha, 1983, 294 pp. (in Japanese)
- 5) Habe, T. and Kosuge, S.: "*Common Shells of Japan in Color*", Hoikusha, Osaka, 1967, 223 pp. (in Japanese)
- 6) Okada, K., Uchida, S., and Uchida, T. (ed.): "*New Illustrated Encyclopedia of the Fauna of Japan-II*", Hokuryukan, Tokyo, 1965, pp. 1-306 (in Japanese)