

EXPERIMENTAL MARINE ORGANISMS COLLECTED IN THE
NEIGHBORHOOD OF THE ASAMUSHI MARINE
BIOLOGICAL STATION¹⁾

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The marine animals and algae which have been used as experimental materials for investigation and education in the Asamushi Marine Biological Station are listed in the chapter I. The majority of data on habitat and breeding season are founded on the personal records of the research and technical stuffs of the Station. The chapter II is the list of the experimental investigations carried on principal materials used commonly in the Station. The literature are collected from the papers numbered as the contributions from the station and the reports by the staffs of the Biological Institute, Tôhoku University.

The explanation of each item described in chapter I is as follows;

- Number. *Species* Japanese name
- a. Habitat or collecting area (see Fig. 1).
 - b. Environments or mode of life.
(Abbreviations) IT.....Intertidal zone: ST.....Subtidal zone:
Pl.....Planktonic life: R.....Rocky area: P.....Pebbly area:
S.....Sandy area: MS.....Muddy-Sand area: M.....Muddy area
 - c. Breeding season.
 - d. Investigators.
 - e. Branches of investigation.
(Abbreviations) Em.....Embryology: Ec.....Ecology: Et.....
Ethology: Ph.....Physiology: Tx.....Taxonomy: Mor.....Mor-
phology: Aq.....Aquarium culture

I. LIST OF EXPERIMENTAL ORGANISMS

COELENTERATA

1. *Corymorpha tomoensis* Tomo-ocumihidora (polyp)
a. Asamushi c. July-Aug. d. KAKINUMA (unpublished) e. Em.

1) Contributions from the Marine Biological Station, Tôhoku University, Aomori City,
No. 428

2) 土屋 誠 長内 健治

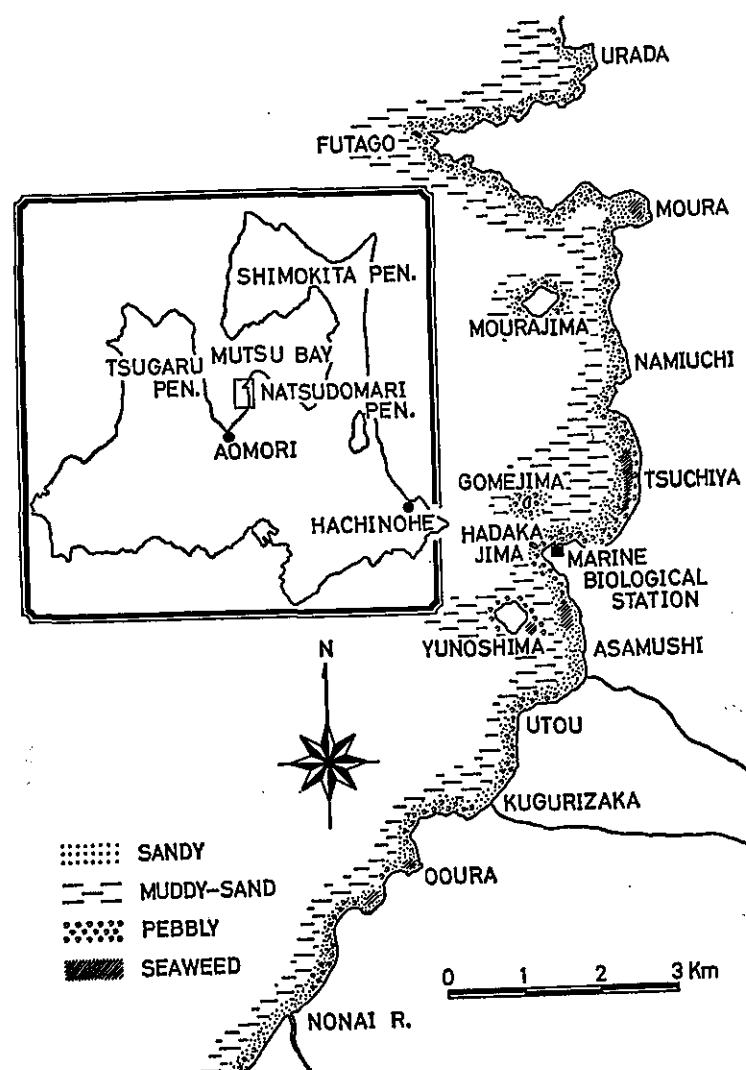


Fig. 1. Map of the seashore around the Asamushi Marine Biological Station, showing bottom substrata.

2. *Euphysa bigelowi* Kataashikurage (medusa)
 - a. Asamushi b. Pl. c. July-Aug. d. KAKINUMA (unpublished)
 - e. Em.
3. *Tubularia mesembryanthemum* Benikudaumihidora
 - a. Utou, Asamushi b. R. c. May-Aug. d. KAKINUMA (unpublished)
 - e. Em.
4. *Tubularia radiata* Kitakudaumihidora
 - a. Shimokita b. R. c. July-Sept. d. KAKINUMA (unpublished)
 - e. Em.

5. *Sarsia tubulosa* Sarushiakurage
 - a. Asamushi b. Pl. c. Mar.-Apr. d. KAKINUMA (1966) e. Em.
6. *Coryne pusilla* Tamaumihidra
 - a. Asamushi, Tsuchiya, Ooura b. R.-brown algae c. late Mar.-early May
 - d. KAKINUMA (1960a, b, c) e. Em.
7. *Coryne uchidai*
 - a. Asamushi, Tsuchiya c. May-July d. KAKINUMA (1961) e. Em.
8. *Hataia parva*
 - a. Asamushi c. Apr.-May d. HIRAI & YAMADA (1965) e. Tax.
9. *Cladonema uchidai* Mutsunoedaashikurage
 - a. common b. Pl.-seaweed c. late June-early Sept. d. KAKINUMA (1962) e. Em.
10. *Cladonema radiatum* var. *mayeri* Edaashikurage
 - a. common b. Pl.-seaweed c. late June-early Sept. d. HIRAI & KAKINUMA (1957a, b) e. Em.
11. *Hydrocoryne miurensis* Ootamaumihidra
 - a. Asamushi b. Pl. c. June-Sept. d. KAKINUMA (unpublished)
 - e. Em.
12. *Cytaeis uchidae* Tamakurage
 - a. Ooura, Moura b. IT.-S., MS. c. late June-late Aug. d. HIRAI & KAKINUMA (1957a, b) e. Em.
13. *Hydroactinia* sp.
 - a. Ooura, Moura b. R. c. July-Aug. d. KAKINUMA (unpublished)
 - e. Em.
14. *Hydrisa sodalis* Igakurikaiumihidra
 - a. Shimokita b. ST.-S. c. May-July d. KAKINUMA (unpublished)
 - e. Em.
15. *Bougainvillia ramosa*
 - a. Kanita d. KAKINUMA (unpublished) e. Em.
16. *Bougainvillia bitentaculata* Edakurage
 - a. Tsuchiya, Ooura b. Pl.-R. c. July-Sept. d. KAKINUMA (unpublished)
 - e. Em.
17. *Rathkea octopunctata* Shimikokurage
 - a. Asamushi b. Pl. d. KAKINUMA (unpublished) e. Em.
18. *Leuckartiara octona* Eboshikurage
 - a. Asamushi b. Pl. d. KAKINUMA (unpublished) e. Em.
19. *Proboscoidactyla flavicirrata* Ningyohidra
 - a. common b. R. c. July-Sept. d. HIRAI (1960) e. Em.
20. *Staurocladia* sp. Izarikurage no issyu
 - a. Tsuchiya b. seaweed c. late Aug.-Sept. d. KAKINUMA (1963)
 - e. Em.

21. *Halecium* sp.
a. common b. IT.-R. c. Apr.-May d. KAKINUMA (Unpublished) e. Em.
22. *Campanularia volvulis* Yoreumisugi
a. common b. R. c. May-July d. KAKINUMA (unpublished) e. Em.
23. *Orthopyxis platycarpa* Hirataashinagakoppugaya
a. common b. R. c. Apr.-Sept. d. KATO *et. al.* (1961), KAKINUMA (unpublished) e. Ec., Em.
24. *Clytia delicatula* Himeumikoppu
a. common b. R. c. Apr.-May d. KAKINUMA (unpublished) e. Em.
25. *Clytia edwardsi* Fusaumikoppu
a. common b. R. c. May-July d. KAKINUMA (unpublished) e. Em.
26. *Obelia geniculata* Edafutooberia
a. common b. R. c. May-Aug. d. KATO *et. al.* (1961), KAKINUMA (unpublished) e. Ec., Em.
27. *Obelia dichotorma* Yaseoberia
a. common b. R. c. May-Aug. d. KATO *et. al.* (1961), KAKINUMA (unpublished) e. Ec., Em.
28. *Obelia plana* Hirataoberia
a. common b. R. c. May-Sept. d. KAKINUMA (unpublished) e. Em.
29. *Sertularia* sp.
a. common b. R. d. KAKINUMA (unpublished) e. Em.
30. *Eugymnanthea cirrhifera* kârukurage
a. Hachinohe d. KAKINUMA (1964) e. Tax.
31. *Aequorea coerulescens* Owankurage
a. Tsuchiya b. Pl. c. Mar.-May d. KAKINUMA (1966) e. Em.
32. *Campanulina* sp.
a. common b. R. c. May-June d. KAKINUMA (unpublished) e. Em.
33. *Hebella* sp.
a. common b. R. c. May-July d. KAKINUMA (unpublished) e. Em.
34. *Aglaophenia uchiteleggi* Shirogaya
a. common b. R. c. June-Aug. d. KAKINUMA (unpublished) e. Em.
35. *Lafoea fruticosa* Kiserugaya
a. common b. R. c. June-Aug. d. KAKINUMA (unpublished) e. Em.
36. *Dynamena hozawai* Hôzawaumishiba
a. common b. R. c. Sept.-Nov. d. KAKINUMA (unpublished) e. Em.
37. *Sertularella miurensis* var. *pungeus* Kiiroumishiba
a. common b. R. c. Apr.-June, Sept.-Oct. d. KATO *et. al.* (1961), NISHIHARA (1967) e. Ec.
38. *Abeitinaria costata* Karehiba
a. common b. R. c. July-Aug. d. KAKINUMA (unpublished) e. Em.

39. *Amphisbetia pacifica* Tenguumikabi
a. common b. R. c. July-Aug. d. KAKINUMA (unpublished) e. Em.
40. *Antenella secundaria* Higegaya
a. common b. R. c. July-Aug. d. KAKINUMA (unpublished) e. Em.
41. *Plumularia strictocarpa* var. *japonica* Kitahanegaya
a. common b. R. c. June-Aug. d. KAKINUMA (unpublished) e. Em.
43. *Plumularia setacea* Hanegaya
a. common b. R. c. June-Aug. d. KAKINUMA (unpublished) e. Em.
43. *Gonionema oshoro* Kitakaginotekurage
a. common b. Pl.-seaweed c. late June-early Sept. d. KAKINUMA (1971) e. Em.
44. *Agloutha digitale* Tsuriganekurage
a. Asamushi b. Pl. c. late Feb.-Mar. d. KAKINUMA (unpublished) e. Em.
45. *Halicyclotus aurciula* Asagaokurage
a. common b. R.-seaweed c. late June-early Aug. d. CHILD (1932), ABE (1936) e. Ph.
46. *Stenosephyphus inabai* Mushikurage
a. common b. seaweed c. July-Aug. d. KAKINUMA (unpublished) e. Em.
47. *Charybdea rastonii* Andonkurage
a. Asamushi b. Pl. c. late Aug.-Sept. d. KAKINUMA (unpublished) e. Em.
48. *Sasakiella cruciformis* Sasakikurage
a. common b. seaweed c. July-Aug. d. KAKINUMA (unpublished) e. Em.
49. *Kishinouyea nagatensis* Jûmnojikurage
a. common b. seaweed c. July-Aug. d. KAKINUMA (unpublished) e. Em.
50. *Dactylometra pacifica* Akakurage
a. common b. Pl. c. June-Aug. d. KAKINUMA (1967) e. Em.
51. *Aurelia aurita* Mizukurage
a. common b. Pl. c. June-Aug. d. KAKINUMA (1962) e. Em.
52. *Carnularia komaii* Komaihanagoko
a. Asamushi c. Mar.-May. d. KAKINUMA (unpublished) e. Em.
53. *Cavenularia obesa* Umisaboten
a. off Yunoshima b. ST.-M., MS. Feb.-Mar. d. KAKINUMA (unpublished) e. Em., Aq.
54. *Anthopleura midori* Moegisoginchaku
a. common b. IT.-R., P. c. Nov.-Dec. d. KAKINUMA (unpublished) e. Em., Aq.

55. *Epiactis japonica* Komochiisoginchaku
a. common b. IT.-R. c. Nov.-Feb. d. KAKINUMA (unpublished)
e. Em., Aq.
56. *Anthopleura pacifica* Hiodoshiisoginchaku
a. common b. IT.-R. d. TORIUMI (1975) e. Ec.
57. *Haliplanella luciae* Tatejimaaisoginchaku
a. common b. IT.-R. d. ATÔDA (1976) e. Em.
58. *Metridium senile* var. *fimbriatum* Hidaberiisoginchaku
a. Futagojima c. Aug.-Sept. d. KAKINUMA (unpublished) e. Em.
59. *Rhiyopsamia minuta mutsuensis* Mutsusango
a. common b. ST.-R. c. Mar. d. KAKINUMA (unpublished) e. Em.

CTENOPHORA

1. *Hormiphora palmata* Fûsenkurage
a. common b. Pl. c. June-Sept. d. KAKINUMA (unpublished) e. Em.
2. *Bolinopsis mikado* Kabutokurage
a. common b. Pl. c. June-Sept. d. KAKINUMA (unpublished) e. Em.
3. *Beroe cumis* Urikurage
a. common b. Pl. c. June-Sept. d. KAKINUMA (unpublished) e. Em.

PLATHELMINTHES

1. *Stylcohus ijimai* Iijimahiramushi
a. common b. IT.-P., R.
2. *Notoplana humilis* Usuhiramushi
a. common b. IT.-P., R. d. TORIUMI (1975) e. Ec.

MEMERTINEA

1. *Amphiporus cervicalis* Yajirobêhimomushi
a. Asamushi b. IT., ST.-P. d. TORIUMI (1975) e. Ph., Ec.
2. *Emplectoenma gracile* Hosomidorihimomushi
a. Asamushi b. IT., ST.-P., R. c. June

SIPUNCULOIDEA

1. *Sipunculus nudus* Sujihoshimushi
a. common b. IT., ST.-R. d. OHUYE (1938) e. Ph.
2. *Siphonosoma cumanense* Sujihoshimushimodoki
a. common b. IT., ST.-R. d. OHUYE (1938) e. Ph.
3. *Physocosoma scolops* Samehadahoshimushi
a. common b. IT., ST.-R. d. OHUYE (1938) e. Ph.

ANNELIDA

1. *Polynoë vexillosa*
d. WATANABE (1930) e. Ph.
2. *Euphrosine superba* Kehadaumikemushi
d. OHUYE (1938) e. Ph.
3. *Nereis microdonta*
d. WATANABE (1930), OHUYE (1938) e. Ph.
4. *Perienereis nuntia* var. *vallata*
a. Yunoshima, Asamushi b. IT.-P. d. TORIUMI (1975) e. Et.
5. *Perinereis nuntia* var. *brevicirrus*
a. Yunoshima, Asamushi b. IT.-P. d. TORIUMI (1975) e. Et.
6. *Tylorrhynchus heterochaetus* Itome
a. Asadokoro, Takase R. b. estuary-IT., MS. d. OHUYE (1937), OSANAI (1977) e. Ph., Em.
7. *Neanthes japonica* Gokai
a. Asadokoro, Takase R., Niida R. b. Estuary-IT., S., MS. c. late Oct.-late Dec. d. NOMURA (1930) e. Ec.
8. *Nephtys caeca* Hayateshiroganegokai
a. Misawa b. ST.-S. d. WATANABE (1930) e. Ph.
9. *Glycera chirori* Chirori
a. Yunoshima b. ST.-P., MS. d. OHUYE (1937) e. Ph.
10. *Marphysa sanguinea* Iwamushi
a. Futago, Yunoshima b. It., ST.-R., P. d. WATANABE (1930) e. Ph.
11. *Lumbrineris japonica* Giboshiisome
a. Asamushi, Yunoshima, off Gomejima b. ST.-MS., M. c. early June
d. NISHIHARA & TSUCHIYA (unpublished) e. Ec.
12. *Cirratulus dasylophus*
d. WATANABE (1930) e. Ph.
13. *Stylarodites pulmosa* Habôkigokai
a. off Gomejima b. ST.-M. d. WATANABE (1930) e. Ph.
14. *Travisia japonica* Nipponoferia
d. OHUYE (1937) e. Ph.
15. *Arenicola cristata* Tamashikigoaki
a. Moura, Ooura b. IT.-S. d. WATANABE (1930) e. Ph.
16. *Potamilla myrops*
d. WATANABE (1930) e. Ph.
17. *Potamilla torelli*
d. OHUYE (1937) e. Ph.
18. *Pseudopotamilla ocellata* Erako
a. common b. IT., ST.-R. d. KAKINUMA (1971) e. Em.

19. *Mixicola infundibulum* Rôtokeyari
d. WATANABE (1930) e. Ph.
20. *Terebella debilis*
d. OHUYE (1937) e. Ph.
21. *Dexiospira alveolatus* Kitauzumakigokai
a. common b. IT., ST.-R., P.
22. *Thalassema gogoshimense* Oomidoriyumushi
d. OHUYE (1937) e. Ph.
23. *Urechis unicinctus* Yumushi
a. Yunoshima b. ST.-S. d. OHUYE (1937) e. Ph.

TENTACULATA

1. *Bowerbankia caudata* Chibiofukurokokemushi
a. common b. ST.-P. c. June-July d. NUMAKUNAI (unpublished)
e. Em.
2. *Bowerbankia imbricata* Sennarikokemushi
a. Tsuchiya b. ST.-*Sargassum tortile* c. June-July, Dec.
d. NUMAKUNAI (unpublished) e. Em.
3. *Amathia distans* Tsubunarikokemushi
a. Tsuchiya b. ST.-*Sargassum tortile* c. July-Aug. d. NUMAKUNAI
(unpublished) e. Em.
4. *Walkeria uva* Itokokemushi
a. Moura b. ST.-*Chorda filum* c. middle Aug.-middle Sept.
d. NUMAKUNAI (unpublished) e. Em.
5. *Bugula neritina* Fusakokemushi
a. Asamushi b. ST.-P d. NUMAKUNAI (1960) e. Em.
6. *Beania mirabilis* Narabikokemushi
a. Asamushi b. ST.-P d. NUMAKUNAI (unpublished) e. Em.
7. *Bicellaira ciliata*
a. Asamushi b. ST.-*Chlamys farreri*, *Patinopecten yessoensis*
d. NUMAKUNAI (unpublished) e. Em.
8. *Tricellaria occidentalis* Hosofusakokemushi
a. common b. ST.-P. c. Jan.-Dec. d. NUMAKUNAI (unpublished)
e. Em.
9. *Dakaria subovoidea* Chigokemushi
a. common b. ST.-P., R. c. July-Aug. d. NUMAKUNAI (unpublished)
e. Em.
10. *Costazia costazii* Kobukokemushi
a. common b. ST.-root of brown algae d. NUMAKUNAI (unpublished)
e. Em.

11. *Tryphyllozoon bimunitum* Yajiriamikokemushi
a. common b. ST.-sinking wood, *Chelyosoma siboya* d. NUMAKUNAI
(unpublished) e. Em.
12. *Lingula unguis* Midorishamisengai
a. Asamushi b. ST.-MS. d. OHUYE (1938) e. Ph.
13. *Terebratalia coreanica* Kamehōzukichochin
a. off Noheji b. ST.-MS., M. d. OHUYE (1937), HIRAI & FUKUSHI
(1960) e. Ph., Em.
14. *Coptothyris grayi* Tatesujihōzukigai
a. off Noheji b. ST.-MS. d. HIRAI & FUKUSHI (1960) e. Em.

MOLLUSCA

1. *Ischnochiton* (s.s.) *comptus* f. *comptus* Usuhizaragai
a. Asamushi b. IT.-P. d. TORIUMI (1975) e. Tx., Ph., Ec.
2. *Callana toreuma* Yomegakasagai
a. Asamushi b. IT.-R. d. TORIUMI (1975) e. Tx., Ec.
3. *Cellana grata* Bekkōkasagai
a. Yunoshima, Goemjima, Futago b. IT.-R. d. TORIUMI (1975)
e. Tx., Ec.
4. *Patellodia* (*Collisellina*) *saccharina* Unoashigai
a. rare b. IT.-R. d. TORIUMI (1975) e. Tx., Ec.
5. *Collisella dorsuosa* Kamogai
a. Common b. IT.-R. d. TORIUMI (1975), ABE (1931) e. Tx., Ec.
6. *Collisella* (*Conoidacmea*) *heroldi* Kogamogai
a. Common b. IT.-R. d. TORIUMI (1975) e. Tx., Ec.
7. *Notoacmea schrenckii* Aogai
a. Asamushi b. IT.-P. d. TORIUMI (1975) e. Tx., Ph., Ec.
8. *Notoacmea concinna* Koudakaaogai
a. Asamushi b. IT.-P. d. TORIUMI (1975) e. Tx., Ph., Ec.
9. *Cantharides jessoensis* Ezochigusagai
a. Asamushi b. IT.-P. c. early Mar.-late Apr.
10. *Monodonta* (*Neomodonta*) *neritoides* Kurozukegai
a. Yunoshima, Gomejima, Shiriya b. It.-R. d. TORIUMI (1975)
e. Tx., Ph., Ec.
11. *Mondonota labio* Ishidatamigai
a. common b. IT.-P. c. July d. TORIUMI (1975) e. Tx., Ph., Ec.
12. *Omphalius rustica* Koshidakagangara
a. common b. IT.-P. d. TORIUMI (1975) e. Tx., Ec., Ph.
13. *Chlorostoma argyrostoma turbinata* Hesoakikubogai
a. common b. IT.-P. d. TORIUMI (1975) e. Tx., Ph., Ec.

14. *Umbonium (Suchium) costatum* Kisago
a. Yokohama, Okunai b. ST.-S. d. TORIUMI (1975) e. Tx.
15. *Lunella coronata* Sugai
a. Urata, Wakinosaawa b. IT.-P., R. d. TORIUMI (1975) e. Tx., Ec.
16. *Ezolittorina squalida* Ezotamakibigai
d. KOJIMA (1958) e. Em.
17. *Nodolittorina granularis* Araretamakibi
a. common b. IT.-R. c. July d. KOJIMA (1960), TORIUMI (1975)
e. Em., Ec.
18. *Littorina mandshurica* Atsutamakibi
a. Natsudomari, Tsuchiya b. IT.-P., R. c. early Feb.-late Mar.
d. KOJIMA (1960) e. Em.
19. *Littorina brevicula* Tamakibi
a. common b. IT.-R. c. early Feb.-late Mar. d. ABE (1935),
TORIUMI (1975) e. Ec., Ph., Tx.
20. *Noritrema silkana* Kurotamakibi
a. Shiriya, Tanesashi b. IT.-R. d. NOMURA (1926), KOJIMA (1960)
e. Mor., Em.
21. *Littoraria strigata* Maruuzuratamakibi
d. KOJIMA (1960) e. Em.
22. *Serpulorbis (Cladopoda) imbricatus* Oohebigai
a. Yunoshima b. IT.-R. d. TORIUMI (1975) e. Tx., Ec.
23. *Batillaria multiformis* Uminina
a. Asadokoro, Asamushi b. IT.-MS., P. d. ABE (1934) e. Ec.
24. *Batillaria cumingii* Hosouminina
a. Asadkoro, Yunoshima b. IT.-MS., P. d. TORIUMI (1975) e. Tx., Ec.
25. *Rapana thomasi* Akanishi
a. Yunoshima b. ST.-P., MS. e. Aq.
26. *Thais bronni* Reishigai
a. common b. IT., ST.-R. d. TORIUMI (1975) e. Tx., Ec.
27. *Thais calvigera* Ibonishi
a. common b. IT., ST.-R. d. TORIUMI (1975) e. Tx., Ec.
28. *Volutharpa ampullacea perryi* Mosusogai
a. Asamushi b. ST.-M. d. HIRAI (1973) e. Em.
29. *Mitrella tenuis* Kôdakamatsumushigai
a. common b. IT.,-R., P. d. TORIUMI (1975) e. Ec., Tx.
30. *Truncatella (Tahetia) guerinii* Kubikiregai
a. Asamushi b. IT.-P. d. TORIUMI (1975) e. Ph. Ec.
31. *Niotha livescens* Mushirogai
a. Ooura b. ST.-S. d. HIRAI & KAKINUMA (1969) e. Em.

32. *Reticunassa fraterculus* Kurosujimushirogai
a. Asamushi b. IT.-P. d. TORIUMI (1975) e. Tx., Ph., Ec.
33. *Petalifera punctulata* Uminamekuji
a. common b. ST.-seaweed d. TORIUMI (1975) e. Ec.
34. *Halioa japonica* Budôgai
a. Hadakajima, Utou b. tide pool c. June-July d. OSANAI (unpub-
lished) e. Em.
35. *Siphonaria japonica* Karamatsugai
a. rare b. IT.-R. c. early May-late July d. ABE (1940), TORIUMI
(1975) e. Ec.
36. *Glycimeris vestitus* Tamakigai
a. common b. ST.-MS., M. d. OHUYE (1937) e. Ph.
37. *Modiolus modiolus difficilis* Ezohibarigai
a. Asamushi b. ST.-P. e. Mor.
38. *Mytilus coruscus* Igai
a. Yunoshima, Goenjima, Futao b. ST.-R. d. TORIUMI (1975) e. Ec.
39. *Mytilus edulis* Murasakiigai
a. common b. IT.-R. c. early Dec.-late May d. OHUYE (1938),
HOSHIAI (1964) e. Ph., Ec.
40. *Septifer virgatus* Murasakiinko
a. common b. IT.-R. d. HOSHIAI (1964) e. Ec.
41. *Crenomytilus grayanus* Ezoigai
a. Yunoshima b. ST., IT.-R. d. OHUYE (1938) e. Ph.
42. *Chlamys farreri* Azumanishikigai
a. Asamushi b. ST.-P. c. June
43. *Patinopecten (Mizuhopecten) yessoensis* Hotategai
a. common b. ST.-MS. c. middle Apr.-middle May d. NOMURA (1932),
YAMAMOTO (1960) e. Ph., Ec.
44. *Anomia chinensis* Namimagashiwagai
a. Asamushi b. IT. ST.-R., P. d. OHUYE (1938) e. Ph.
45. *Crassostrea gigas* Magaki
a. Futagojima b. IT., ST.-R. c. June-Aug. d. SUZUKI (1934), TORIUMI
(1975) e. Mor.
46. *Ostrea circumpecta* Kokegoromogaki
a. Asamushi b. ST.-R., P. d. TERAU (1926), TAKATSUKI (1927)
e. Em., Ph.
47. *Saxidomus purpuratus* Uchimurasaki
a. Yunoshima b. ST.-P. d. TORIUMI (1975) e. Ec.
48. *Phacosoma japonica* Kagamigai
a. Asamushi b. ST.-MS. d. TORIUMI (1975) e. Ec.

49. *Ruditapes philippinarum* Asari
a. Oshima, Yunoshima b. IT.-S., P. d. TORIUMI (1975) e. Tx., Ec.
50. *Tapes (Amygdala) variegata* Himeasari
a. Oshima, Yunoshima b. IT.-S., P. d. TORIUMI (1975) e. Tx., Ec.
51. *Caecella chinensis* Kuchibagai
a. Oshima, Futagojima b. IT.-S., P. c. middle July-late Aug.
d. YAMAMOTO (1971) e. Em.
52. *Nuttallia olivacea* Isoshijimi
a. Asadkoro, Moura b. IT.-S. MS. d. TORIUMI (1975) e. Ec.
53. *Macoma contabulata* Sabishiratorigai
a. Yunoshima, Moura, Ooura b. IT., ST.-S.P. d. TORIUMI (1975)
e. Ec.
54. *Mya arenaria oonogai* Oonogai
a. Ooura b. ST., IT.-S. d. TORIUMI (1975) e. Ec., Aq.
55. *Laternula limicola* Sotoorigai
a. Asadokoro b. IT.-MS. d. TORIUMI (1975) e. Ec.
56. *Idiosepius paradoxus* Himeika
a. Asamushi b. ST.-seaweed d. OHUYE (1938) e. Ph.
57. *Doryteuthis bleekeri* Yariika
a. Tsugaru Strait c. May e. Aq.
58. *Octopus ocellatus* Iidako
a. Tsuchiya b. ST.-S. c. middle May-middle June
59. *Polypus dofleini* Mizudako
a. common b. ST.-P., R. c. early May-late June d. OHUYE (1938)
e. Ph.

ARTHROPODA

1. *Tigriopus japonicus*
a. Hadakajima b. Tide pool d. IGARASHI (1959) e. Ec.
2. *Mitella mitella* Kamenote
a. Futagojima b. IT.-R. d. TORIUMI (1975) e. Ec.
3. *Citharus challengeri* Iwafujitsubo
a. common b. IT.-R. d. KATO *et al.* (1959) e. Ec.
4. *Balanus amphitrite albicostatus* Shirofujitsubo
a. Futagojima b. IT.-R. d. TORIUMI (1975) e. Ec.
5. *Balanus trigonus* Sankakufujitsubo
a. common b. ST.-R. d. TORIUMI (1975) e. Ec.
6. *Balanus rostratus eurostratus* Minefujitsubo
a. common b. ST.-R. d. TORIUMI (1975) e. Ec.
7. *Balanus cariosus* Chishimafujitsubo
a. common b. ST.-R. d. TORIUMI (1975) e. Ec.

8. *Tetrachite squamosa japonica* Kurofujitsubo
a. Futagojima b. IT.-R. d. TORIUMI (1975) e. Ec.
9. *Gastrosaccus vulgaris* Shikishimafukuroami
a. Misawa b. ST.-S. d. TORIUMI (1975) e. Ec.
10. *Excirolana (Pontogeroidea) japonica* Himesunahorimushi
a. Shimokita b. IT.-S., MS. d. TORIUMI (1975) e. Ec.
11. *Gnoringosphaeroma oregonensis* Isokotsubumushi
a. Kuchihiro b. IT.-P. d. TORIUMI (1975) e. Ec.
12. *Synidotea laevidorsalis* Warajiheramushi
a. Asamushi b. ST.-seaweed d. TORIUMI (1975) e. Ec.
13. *Idotea ochotensis ochotensis* Ohotsukuharamushi
a. common b. ST.-seaweed d. TORIUMI (1975) e. Ec.
14. *Ligia (Megaligia) exotica* Funamushi
a. common b. IT.-R.P. d. TORIUMI (1975) e. Ec.
15. *Tylos granulatus* Hamadanogomushi
a. Okunai b. IT.-S. d. TORIUMI (1976) e. Ec.
16. *Talorchestia brito* Higenagahamatobimushi
a. Misawa b. IT.-S. d. TORIUMI (1975) e. Ec.
17. *Orchestia platensis* Himehamatobimushi
a. Misawa b. IT.-S. d. TORIUMI (1975) e. Ec.
18. *Caprella acutifrons* Maruerawarekara
a. common b. ST.-seaweed d. TORIUMI (1975) e. Ec.
19. *Alpheus brevirostratus* Teppôebi
a. Yunoshima b. ST.-MS. d. TORIUMI (1975) e. Ec.
20. *Heptacarpus pandalodites* Tsunomoebi
a. Asamushi b. ST.-seaweed d. OHUYE (1938) e. Ph.
21. *Pagurus samuelis* Honyadokari
a. common b. IT.-P., R. d. TORIUMI (1975) e. Ec.
22. *Pagurus lanuginosus* Keashihonyadokari
a. common b. IT.-P., R. d. TORIUMI (1975) e. Ec.
23. *Pagurus middendorfi* Tenagahonyadokari
a. common b. IT.-P., R. d. TORIUMI (1975) e. Ec.
24. *Upogebia major* Anajako
a. Asadokoro b. IT.-MS. d. TORIUMI (1975) e. Ec.
25. *Callianassa japonica* Nihonsunamoguri
a. Asadokoro b. IT.-MS. d. TORIUMI (1975) e. Ec.
26. *Cryptolithodes expansus* Menkogani
a. common b. ST.-R., P. d. TORIUMI (1975) e. Ec.
27. *Haplogaster dentata* Ibotogegani
a. Asamushi b. IT., ST.-R., P. d. TORIUMI (1975) e. Ec.

28. *Philyra pisum* Mamekobushigani
a. rare b. ST.-S., MS. d. TORIUMI (1975) e. Ec.
29. *Pugettia quadridens* Yotsuhamogani
a. Asamushi, Moura b. ST.-seaweed d. TORIUMI (1975) e. Ec.
30. *Cancer amphioetus* Koichôgani
a. common b. ST.-R. d. TORIUMI (1975) e. Ec.
31. *Huenia proteus* Konohagani
d. OHUYE (1938) e. Ph.
32. *Macrophthalmus japonicus* Yamatoosagani
a. Asadokoro b. IT.-MS. d. TORIUMI (1975) e. Ec.
33. *Scopimera globosa* Kometsukigani
b. IT.-S. d. TORIUMI (1975) e. Ec.
34. *Eriocheir japonica* Mokuzugani
a. Asadokoro b. estuary
35. *Hemigrapsus sanguineus* Isogani
a. Asamushi, Moura b. IT.-P. d. TORIUMI (1975) e. Ec.
36. *Hemigrapsus penicillatus* Kefusaisogani
a. Asadokoro, Namiuchi, Kawauchi River b. IT.-P. d. TORIUMI (1975)
e. Ec.
37. *Gaetice depressus* Hiraisogani
a. Asadokoro, Namiuchi b. IT.-MS., P. d. TORIUMI (1975) e. Ec.

ECHINODERMATA

1. *Ophiopholis mirabilis* Madarakumohitode
a. Yunoshima b. ST.-MS. e. Mor.
2. *Ophiura kinbergi* Kushinohakumohitode
a. Yunoshima b. ST.-MS.
3. *Luidia quinaria* Sunahitode
a. Yunoshima b. ST.-MS. c. late June - July e. Em.
4. *Asterina pectinifera* Itomakihitode
a. common b. ST.-P. c. middle Aug.-late Sept. d. NOMURA (1926),
OHUYE (1938) e. Ph., Em.
5. *Henrica nipponica* Himehitode
a. Asamushi b. ST.-P. d. OHUYE (1938) e. Ph.
6. *Asterias amurensis* Hitode
a. Asamushi b. ST.-P. c. early Apr.-middle May d. OKADA (1950)
e. Em.
7. *Distolasterias nippon* Nihonhitode
a. Yunoshima b. ST.-MS. c. middle Mar.-early May.
8. *Aphelasteria japonica* Ezohitode
a. Asamushi b. ST.-P. c. early Oct.-late Nov. d. OHUYE (1938)

- e. Ph.
9. *Glyptocidaria crenularis* Tsugaruuni
a. Yunoshima b. ST.-MS. c. early Mar.-late Apr. d. OSANAI (1960),
FUKUSHI (1961) e. Em.
10. *Temnopleurus hardwickii* Kitasanshouni
a. Tsuchiya, Asamushi, Nonai b. ST.-MS. c. late June-late Aug.
d. MOORE (1933), MOTOMURA (1940) e. Em.
11. *Strongylocentrotus nudus* Kitamurasakiuni
a. Asamushi b. ST.-P. c. middle Sept.-early Nov. d. MOTOMURA
(1934), OSANAI (1974) e. Em.
12. *Strongylocentrotus intermedius* Ezobafununi
a. Asamushi b. ST.-P. c. Mar.-Apr., early Nov.-early Dec.
d. OSANAI (1974) e. Em.
13. *Hemicentrotus pulcherrimus* Bafununi
a. Asamushi b. ST.-P. c. early Dec.-middle May d. MOTOMURA
(1950), OSANAI (1960) e. Em.
14. *Echinocardium cordatum* Okamebunbuku
a. Asamushi b. ST.-S. c. middle Apr.-late July
15. *Stichopus japonicus* Manamako
a. Yunoshima b. ST.-MS. c. June
16. *Cucumaria frondosa* var. *japonica* Kinko
a. Kugurizaka, Nonai b. ST.-MS. c. Apr.
17. *Paracaudina chilensis ransonneti* Shironamako
a. Moura, Ooura b. ST.-S. c. May d. YAMANOUCHI (1926), NOMURA
(1926) e. Et., Ph.
18. *Leptosynapta inhaerens* Hosoikarinamako
a. Kuchihiro b. IT.-P. d. OHUYE (1938), KOZATO (1960) e. Ph., Tx.
19. *Lapidoplax dubia* Uchiwaikarinamako
a. off Gomejima b. ST.-M. d. HOSHIAI (1963) e. Ec.
20. *Patinapta ooplax* Himoikarinamako
d. TORIUMI (1975) e. Tx., Mor.
21. *Clypeaster japonicus* Takonomakura
a. Yunoshima b. ST.-S. d. MOORE (1933) e. Ph., Em.

PROTOCHORDATA

1. *Amaroucium pliciferum* Manjûboya
a. common b. ST.-R., P. d. NUMAKUNAI (unpublished) e. Em.
2. *Leptoclinum mitsukurii* Nenekiboya
a. Asamushi b. ST.-R., P. c. late Aug.-early Sept. d. NUMAKUNAI
(unpublished) e. Em.

3. *Oyathocormus mirabilis* Koppuboya
d. HIRAI (1954) e. Em.
4. *Perophora formosana* Taiwanmameboya
a. common ST.-P. d. HIRAI (1954) e. Em.
5. *Ciona intestinalis* Yûreiboya
a. Kugurizaka, Nonai, Futago b. ST.-R. c. Apr.-Oct. d. HIRAI (1963)
e. Em.
6. *Ciona robusta* Katayureiboya
a. Kugurizaka, Nonai, Futago b. ST.-R. c. Summer d. NUMAKUNAI &
HOSHINO (unpublished) e. Em., Mor.
7. *Ascidia sydneinsis samea* Sujikireboya
a. common b. ST.-R. c. June-July d. KOBAYASHI (1940) e. Ph.
8. *Ascidia zara* Zaraboya
a. Asamushi b. ST.-R. c. July-Aug. d. NUMAKUNAI (unpublished)
e. Em.
9. *Corella japonica* var. *asamushi* Asamushiboya
a. common b. ST.-MS. c. Jund-Aug. d. NUMAKUNAI (unpublished)
e. Em.
10. *Phodosoma turcicum* Gamaguchiboya
a. Kugurizaka, Nonai b. ST.-*Cheolysosoma siboya* d. NUMAKUNAI
(unpublished) e. Em.
11. *Cheolysosoma siboya* Suboya
a. common b. ST.-R. c. middle Dec.-early Jan. d. KOBAYASHI (1933),
HIRAI *et. al.* (1963) e. Ph., Em.
12. *Botryllodes violaceum* Itaboya
a. common b. ST.-P. c. late June-July d. NUMAKUNAI (unpublished)
e. Em.
13. *Pyura mirabilis* Makuraboya
a. common b. ST.-P. d. NUMAKUNAI (unpublished) e. Em.
14. *Halocynthia roretzi* Maboya
a. Kugurizaka, Nonai, Futago b. ST.-R. c. Nov., Apr. d. HIRAI
(1964), NUMAKUNAI (1965) e. Em.
15. *Halocynthia hilgendorf f. igaboya* Igaboya
a. Kugurizaka, Nonai b. ST.-R. d. NUMAKUNAI (unpublished) e. Em.
16. *Halocynthia hilgendorf f. ritteri* Ritteruboya
a. Kugurizaka, Nonai b. ST.-R. d. NUMAKUNAI (unpublished)
e. Em.

VERTEBRATA (Pisces)

1. *Scyliorhinus torazame* Torazame
a. common e. Aq.

2. *Mustelus manago* Hoshizame
a. common e. Aq.
3. *Raji kanojei* Gangiei
a. common e. Aq.
4. *Dasyatis akabei* Akabei
a. common e. Aq.
5. *Sillago sihama* Kisû
a. common e. Aq.
6. *Etrumeus teres* Urumeiwashi
a. common e. Aq.
7. *Sardinops melanoticta* Maiwashi
a. common e. Aq.
8. *Engraulis japonica* Katakuchiiwashi
a. common e. Aq.
9. *Oncorhynchus keta* Sake
a. common e. Aq.
10. *Oncorhynchus masou* Sakuramasu
a. common e. Aq.
11. *Salangichthys micordon* Shirauo
a. common e. Aq.
12. *Ashetognathus morikae* Tanago
a. common e. Aq.
13. *Tribolodon hakonensis* Ugui
a. common b. estuary e. Aq.
14. *Cololabis sarai* Sanma
a. rare e. Aq.
15. *Hemiramphus sajori* Sayori
a. common e. Aq.
16. *Katsuwonus pelamis* Katsuo
a. rare e. Aq.
17. *Aulichtithys japonicus* Kudayagara
a. common e. Aq.
18. *Syngnathus schlegeli* Yôjiuo
a. common b. seaweed e. Aq.
19. *Hippocampus coronatus* Tatsunootoshigo
a. common b. seaweed e. Aq.
20. *Mugil cephalus* Bora
a. common b. estuary e. Aq.
21. *Mugil haematochilus*
a. common e. Aq.

22. *Thunnus thynnus* Kuromaguro
a. rare e. Aq.
23. *Scomber japonicus* Masaba
a. common e. Aq.
24. *Trachurus japonicus* Maaji
a. common e. Aq.
25. *Seriola quinqueradiata* Buri
a. common e. Aq.
26. *Ophegnatus fasciatus* Ishidai
a. common e. Aq.
27. *Lateolabrax japonicus* Suzuki
a. common e. Aq.
28. *Pagrus major* Madai
a. common e. Aq.
29. *Erynnis japonica* Chidai
a. common e. Aq.
30. *Acanthopagrus schlegelii* Kurodai
a. common e. Aq.
31. *Callionymus punctatus* Nezumigochi
a. common e. Aq.
32. *Ammodytes personatus* Ikanago
a. common e. Aq.
33. *Omobranchus elegans* Nabeka
a. common e. Aq.
34. *Azuma emmion* Fusaginpo
a. common e. Aq.
35. *Opisthocentrus ocellatus* Genna
a. common b. seaweed e. Aq.
36. *Enedrias nebulosus* Ginpo
a. common b. P. e. Aq.
37. *Dictyosoma burgeri* Dainanginpo
a. common b. P. d. TORIUMI (1975) e. Aq. Ec.
38. *Pterogobius zacalles* Ryûgûhaze
a. common b. P. e. Aq.
39. *Chasmichthys dolichognathus gulosus* Dorome
a. common b. P. d. TORIUMI (1975) e. Aq. Ec.
40. *Chasmichthys dolichognathus dolichognathus* Agohaze
a. common e. Aq.
41. *Tridentiger tridenoccephalus* Shimahaze
a. common e. Aq.

42. *Leucopsarion petersi* Shirouo
a. common b. Nonai River, Kawauchi River. c. May e. Aq.
43. *Ditrema temminckii* Umitanago
a. common e. Aq.
44. *Halichoeres poecilopterus* Kyûsen
a. common b. S. e. Aq.
45. *Rudarius ercoeds* Amimehagi
a. common e. Aq.
46. *Lepidotrigla microptera* Kanagashira
a. common e. Aq.
47. *Navodon modestus* Umazurahagi
a. common e. Aq.
48. *Fugu rubripes rubripes* Torafugu
a. common e. Aq.
49. *Fugu niphobles* Kusafugu
a. common c. May e. Aq.
50. *Fugu vermiculare porphyreum* Mafugu
a. common e. Aq.
51. *Fugu stictanotum* Gomafugu
a. common e. Aq.
52. *Fugu pardale* Higanfugu
a. common c. May e. Aq.
53. *Sebastes inermis* Mebaru
a. common e. Aq.
54. *Sebastes schlegelii* Kurosoi
a. common e. Aq.
55. *Sebastes vulpes* Kitsunemebaru
a. common e. Aq.
56. *Sebastes oblongus* Takenokomebaru
a. common e. Aq.
57. *Sebastes pachycephalus pachycephalus* Murasoi
a. common e. Aq.
58. *Sebastes tribittatus* Shimasoi
a. common e. Aq.
59. *Pterois lunulata* Minokasago
a. rare e. Aq.
60. *Inimicus japonicus* Oniokoze
a. common e. Aq.
61. *Agrammus agrammus* Kujime
a. common e. Aq.

62. *Plurogrammus azonus* Hokke
a. common e. Aq.
63. *Hexagrammus otakii* Ainame
a. common e. Aq.
64. *Ocynectus modestus* Mutsukajika
a. common e. Aq.
65. *Pseudoblennius zomostigma* Obianahaze
a. common e. Aq.
66. *Blepias cirrhosus draciscus* Isobatengû (Sachiko)
a. common e. Aq.
67. *Paralichthys olivaceus* Hirame
a. common e. Aq.
68. *Pleuronichthys cornutus* Meitagarei
a. common e. Aq.
69. *Lepidosetta mochigarei* Asabagarei
a. common e. Aq.
70. *Limanda punctatissima* Sunagarei
a. common e. Aq.
71. *Limanda herzensteini* Magarei
a. common e. Aq.
72. *Limanda yokohama* Makogarei
a. common d. YUSA (1960) e. Aq., Ec.
73. *Limanda schrenki* Kurogashirakarei
a. common d. YUSA (1960) e. Aq., Ec.
74. *Kareius bicoloratus* Ishigarei
a. common e. Aq.
75. *Microstomus achne* Babagarei
a. common e. Aq.
76. *Physiculus japonicus* Chigadara
a. common e. Aq.
77. *Lotella maximowiczi* Ezoisoainame
a. common e. Aq.
78. *Gadus macrocephalus* Madara
a. common e. Aq.
79. *Lophiomus setigerus* Ankô
a. common e. Aq.
80. *Histrio histrio* Hanaokoze
a. rare e. Aq.

ALGAE

1. *Coccophora langsдорфii* Sugimoku
a. Asamushi b. ST.-R. d. TAHARA (1929), NAKAZAWA (1950) e. Em.
2. *Sargassum confusum* Fushisujimoku
a. Asamushi b. ST.-R. d. ABE (1933), NAKAZAWA (1950) e. Em.
3. *Sargassum tortile* Yoremoku
a. Asamushi b. ST.-R. d. NAKAZAWA (1957) e. Em.
4. *Fucus evanescens* Hibamata
a. Asamushi b. ST.-R. d. NAKAZAWA (1957) e. Em.

II. INVESTIGATIONS ON PRINCIPAL ANIMALS

Coryne uchidai, *C. pusilla* Tamaumihidora

Ecology: KATO *et. al.* 1961 Distribution pattern of hydrozoa. KATO *et. al.* 1962 Interspecific relation among some hydrozoan.

Embryology: KAKINUMA 1960a Differentiation of an isolated piece. KIKINUMA 1960b Differentiation of hydranth from planula. KAKINUMA 1960c Life cycle. KAKINUMA 1961a Life cycle. KIKINUMA 1961b Budding from hydrozoan. AIZU 1969 Regeneration of the ectoderm and endoderm. HIRAI 1969 Environmental factors on the differentiation of hydrozoans. KATO *et. al.* 1975 Active substances which induce the metamorphosis. KATO *et. al.* 1975 Structure and synthesis of active component which induces the settling of swimming larvae. KITAHARA *et. al.* 1976 Active substance which induces the metamorphosis. KAKINUMA & KATO 1977 Bio-assay on the settlement of the planula.

Proboscoidactyla flavicirrata Ningyôhidora

Embryology: KAKINUMA 1961 Life cycle. HIRAI 1969 Environments and differentiation of hydrozoan. HIRAI & KAKINUMA 1969 Life cycle. HIRAI & KAKINUMA 1971 Symbiosis and differentiation. KAKINUMA 1971a Differentiation of the organs during the life cycle. HIRAI & KAKINUMA 1973 Symbiosis and differentiation.

Cytaeis uchidae Tamakurage

Embryology: KAKINUMA 1961 Life cycle. HIRAI 1969 Environmental factors on the differentiation of hydrozoans. HIRAI & KAKINUMA 1970 Differentiation of the medusa bud. HIRAI & KAKINUMA 1973 Symbiosis and differentiation. HIRAI & KAKINUMA 1971 Differentiation of organs and settlement.

Cladonema uchidai Edaashikurage

Embryology: HIRAI & KIKINUMA 1957a Development cycle. HIRAI & KAKINUMA 1957b Structure of the hydranth of medusa. KAKINUMA 1961 Life

cycle. KAKINUMA 1962 Some factors for the differentiation of medusa. KAKINUMA 1969 Differentiation of the isolated medusa. KAKINUMA 1975 Organization and organs.

Aurelia aurita Mizukurage

Embryology: HIRAI 1958 Developmental cycle. KAKINUMA 1961 Life cycle. KAKINUMA 1962 Factors of differentiation. CHIBA 1969 Ecological factors affecting the strobilation. KAKINUMA 1975a,c Developmental cycle in the laboratory. KAKINUMA 1975b Experimental study of differentiation of organs. KAKINUMA 1975d Organization and organs.

Ostrea circumpecta Kokeyoromogaki

Developmental Biology: TERA0 1926 Fertilization. USUKI 1952 Fertilization.

Physiology: TAKATSUKI 1927 Heart pulsation. KOBAYASHI 1929 Muscle-lactic acid and glycogen. KOKUBO 1929 Bodyfluid, pH and CO₂ content of the blood. KUMANO 1929 Chemical analysis on the pericardial fluid and the blood. SAWANO 1929 Digestive enzymes. TAKATSUKI 1929 Heart pulsation. TAMURA 1929 Power of the adductor muscle. YAZAKI 1929 Physico-chemical properties of the pericardial fluid and the blood. YAZAKI 1930 Circulation of the pericardial fluid. OKA 1932 Cardiac nerve. SAWANO & MITSUGI 1932 Toxic action of the stomach extracts of the starfishes on the heart of the oyster. TAKATSUKI 1932 Automaticity in the ventricle and auricle of the heart as affected by the temperature. TAKATSUKI 1933 Action of adrenaline on the isolated heart. SUZUKI 1934 1934 Distribution of ganglion cells. HAMADA 1938 Influence of several ions to the fertilization. TOMITA 1955 Ciliary antigens.

Patinopecten (Mizuhopecten) yessoensis Hotategai

Developmental Biology: YAMAMOTO 1950 Spawning behavior. YAMAMOTO 1951d Induction of spawning. YAMAMOTO 1951b Variation of spawning. YAMAMOTO 1952b Spawning. OSANAI 1975 Gonad development and sex alteration.

Ecology and Fishery: YAMAMOTO *et. al.* 1950 Methods of multiplication. YAMAMOTO *et. al.* 1950 Ecological study. YAMAMOTO 1951c Methods of multiplication, spawning cycle and benthic communities. YAMAMOTO & ETO 1951 Transplantation. YAMAMOTO 1952a Relations between scallop production and benthic communities. YAMAMOTO 1952c Spawning and plankton as index of environment. YAMAMOTO 1953a Autoecological and synecological study, relation with environment, plankton and benthos. YAMAMOTO 1953b Methods of multiplication, the most suitable habitat. YAMAMOTO 1955 Experiments as to production efficiency. YAMAMOTO 1956 Settling environment. YAMAMOTO 1957a Tolerance to the environmental change. YAMAMOTO 1957b Methods of multiplication. YAMAMOTO 1960 Mortality. YAMAMOTO 1975 Review.

Asterina pectinifera Itomakihitode

Developmental Biology: NOMURA 1924 Sperm agglutinating substance. MOTOMURA 1941b Materials of fertilization, membrane. MOTOMURA 1941d Artificial insemination. HIRAI *et. al.* 1973 Role of follicle cells, 1-methyl adenine. HIRAI 1976 Role of germinal vesicle, swelling of sperm nuclei.

Temnopleurus hardwickii Kitasanshōuni

Histology: OHUYE 1936 Coelomic corpuscles, cytochemistry.

Developmental Biology: MOORE 1933 Early development. MOTOMURA 1935 Determination of the embryonic axis, role of cortical cytoplasm. MOTOMURA 1940 Changes of surface area in first cleavage. MOTOMURA 1942 Cleavage plane formation. MOTOMURA 1947 Cleavage plane formation, role of vacuoles. MOTOMURA 1949b Artificial alteration of embryonic axis in centrifuged eggs. MOTOMURA 1949c Artificial alteration of embryonic axis with centrifuge. MOTOMURA 1950 Cleavage plane formation, role of vacuoles. MOTOMURA 1954 Toughening of fertilization membrane. MOTOMURA 1958 Secretion of mucosubstance in cleaving egg. FUKUSHI 1959 Echinus rudiment and metamorphosis. OSANAI 1963 Partially activation of eggs. OSANAI 1964b Cytochemistry of cortical granules. OSANAI 1964c Effect of sperm extract on eggs. OSANAI 1969 Behavior of pigment granules in egg during early development.

Glyptocidaris crenularis Tsugaruuni

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Hemicentrotus (Strongylocentrotus) pulcherrimus Bafununi

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Strongylocentrotus nudus Kitamurasakiuni

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Paracaudina chilensis ransonneti Shironamako

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Physiology: OKAZAKI & KOIZUMI 1926 Component of the blood. KAWAMOTO 1927 Anatomy of pericardial cavity and blood and water vascular system. OGAWA 1927 Respiration. KAWAMOTO 1928 Hemoglobin, oxygen capacity of the blood.

SAWANO 1928 Digestive enzyme. TADOKORO & WATANABE 1928 Sex difference of blood protein. YAMANOUCHI 1929c Reactions to centrifugal force. KOBAYASHI 1932 Hemoglobin. KOIZUMI 1932 Permeability and ionic equilibrium. KOIZUMI 1935a Velocity of permeation of Cl^- and SO_4^{2-} . KOIZUMI 1935b Velocity of permeation of K^+ , Na^+ , Ca^{2+} and Mg^{2+} . KOIZUMI 1935c Ionic composition of the body fluid. KOIZUMI 1935d Ionic composition of the longitudinal muscles and body wall. KOIZUMI 1938 Irreciprocal permeability of the isolated body wall.

Halocynthia roretzi Maboya

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