

Zoogeographical Distribution of Marine Hydroids (Cnidaria: Hydrozoa: Hydroïda) in Korea

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한국 해산 히드라충류의 동물지리학적 분포

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적 요

지금까지 밝혀진 한국 해산 히드라충류는 17과 55속 120종이다. 이 가운데 *Abietinaria filicula* (Ellis and Solander, 1786)는 한국 미기록종으로 밝혀졌고 *Sertularella miurensis* Stechow, 1921는 96개 채집지 가운데 33개 지점에서 채집되어 한국해역의 히드라충류 가운데 우점종으로 나타났다. 한국 해역은 동해, 남해, 황해 그리고 제주도의 4개 해역으로 나뉜다. 각 해역에서 채집된 종수는 동해 43종, 남해 73종, 황해 52종 그리고 제주도 83종으로 나타났다. 따라서 제주도 해역은 한국 해산 히드라충류의 가장 높은 다양화를 나타낸다고 할 수 있다. 각 해역간의 균집계수는 동해-황해가 0.444, 동해-남해가 0.553, 동해-제주도가 0.519, 황해-남해가 0.682, 황해-제주도가 0.533 그리고 남해-제주도가 0.642이다. 그러므로 히드라충류의 분포에 따른 두 해역 사이의 연관은 황해-남해가 가장 높고 동해-황해가 가장 낮다.

Key words: zoogeographical distribution, marine hydroids, Korea.

INTRODUCTION

On the study of Korean marine hydroids, it is the first time that the Japanese Kamita and Sato (1941)

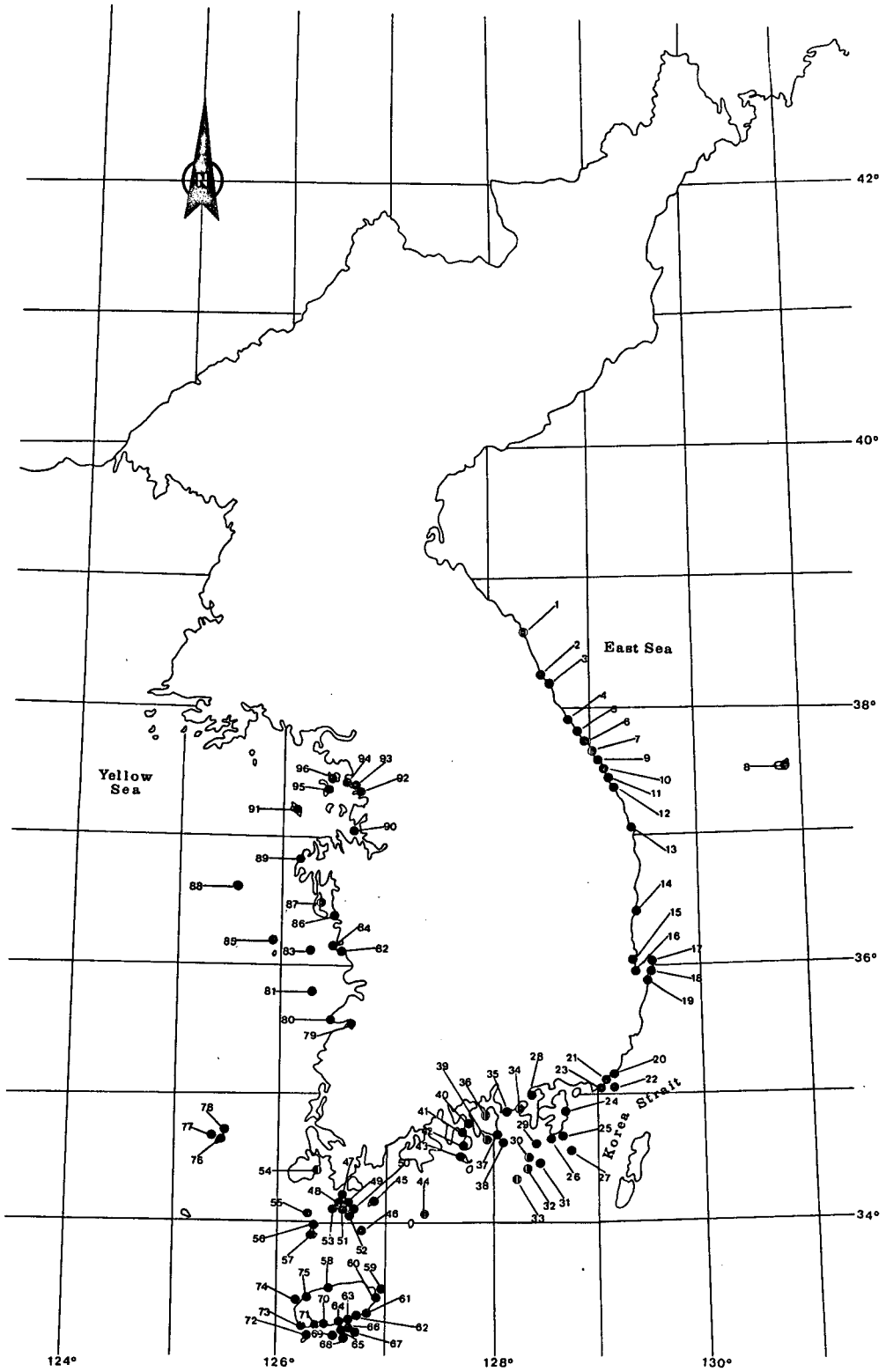


Fig. 1. For legend see next page.

reported four species in the check list on marine fauna at Jinsen (Inchon) Bay. And then, the most comprehensive taxonomic accounts have been done by Rho (1967, 1969), Rho and Chang (1972, 1974), Rho and Park (1979, 1980, 1984, 1986), Park and Rho (1986) and Park (1988, 1990, 1991). By these studies 119 species and/or subspecies of 55 genera in 17 families have been known from Korean waters. *Abietinaria filicula* (Ellis and Solander, 1786) which is new record in Korean waters is added newly by the writer, so that the Korean marine hydroid fauna identified to date consists of 120 species and/or subspecies of 55 genera in 17 families. The genera and the families are listed below, with the species number of each genus in parentheses. Tubulariidae: *Tubularia* (1); Ptilocodiidae: *Hydrichthella* (1); Clavidae: *Turritopsis* (1); Bougainvilliidae: *Bimeria* (1); Eudendriidae: *Eudendrium* (4); Solanderiidae: *Solanderia* (2); Sphaerocorynidae: *Sphaerocoryne* (1); Hydractiniidae: *Hydrissa* (1); Corynidae: *Coryne* (1); Lafoëidae: *Lafoëa* (1), *Zygophylax* (1), *Filellum* (1), *Cryptolaria* (1), *Acryptolaria* (1), *Grammaria* (1); Hebellidae: *Hebella* (1), *Scandia* (1); Haleciidae: *Halecium* (5), *Hydrodendron* (3); Campanulinidae: *Calycella* (1), *Modeeria* (1); Campanulariidae: *Eucalix* (1), *Campanularia* (1), *Orthophyxis* (1), *Rhizocaulus* (1), *Eucopella* (2), *Clytia* (3), *Obelia* (4); Syntheciidae: *Synthecium* (1); Sertulariidae: *Diphasia* (1), *Dynamena* (2), *Symplectoscyphus* (1), *Abietinaria* (2), *Amphisbetia* (1), *Pasythea* (1), *Sertularia* (6), *Sertularella* (16), *Thuiaria* (9), *Selaginopsis* (4); Plumulariidae: *Halopteris* (1), *Antennella* (3), *Antennellopsis* (1), *Monothecha* (1), *Monostaechas* (1), *Kirchenpaueria* (1),




Fig. 1. Diagrammatic map of Korea showing the sampling sites during years 1959-1990, 1, Taejin(대진) ; 2, Sokch'o(속초) ; 3, Naksan(낙산) ; 4, Chumunjin(주문진) ; 5, Kangnŭng(강릉) ; 6, Aninjin(안인진) ; 7, Songjŏng(송정) ; 8, Ullŭngdo(울릉도) ; 9, Samch'ŏk(삼척) ; 10, Kŭndŏk(근덕) ; 11, Changho(장호) ; 12, Imwon(임원) ; 13, Chukpyŏn(죽변) ; 14, Ch'uksan(축산) ; 15, P'ohang(포항) ; 16, Yŏng-ilman(영일만) ; 17, Kuryongp'o(구룡포) ; 18, Mop'o(모포) ; 19, Kamp'o(감포) ; 20, Mip'o(미포) ; 21, Haeundae(해운대) ; 22, Oryukto(오륙도) ; 23, Pusan harbour(부산항) ; 24, Kŏjedo(거제도) ; 25, Haegŭmgang(해금강) ; 26, Yundoldo(윤돌도) ; 27, Hongdo(홍도) ; 28, Ch'ungmu(충무) ; 29, Pijindo(비진도) ; 30, Ch'ŏngsa(청사) ; 31, Yŏnhwado(연화도) ; 32, Yokchido(육지도) ; 33, Kaldo(갈도) ; 34, Shinsudo(신수도) ; 35, Samch'ŏnp'o(삼천포) ; 36, Nodo(노도) ; 37, Sangju-ri(상주리) ; 38, Mijo-ri(미조리) ; 39, Mokto(목도) ; 40, Odongdo(오동도) ; 41, Yŏsu(여수) ; 42, Tolsando(돌산도) ; 43, Kŭm-odo(금오도) ; 44, Kŏmundo(거문도) ; 45, Ch'ŏngsando(청산도) ; 46, Yŏsŏdo(여서도) ; 47, Wando(완도) ; 48, Nohwado(노화도) ; 49, Toch'ŏng-ri(도청리) ; 50, Shinhŭng-ri(신흥리) ; 51, Yesong-ri(예송리) ; 52, Yejakto(예작도) ; 53, Pogildo(보길도) ; 54, Chindo(진도) ; 55, Hoegangdo(횡간도) ; 56, Sasudo(사수도) ; 57, Ch'ujado(추자도) ; 58, Cheju harbour(제주도) ; 59, Udo(우도) ; 60, Sŏngsanp'o(성산포) ; 61, P'yoson(포선) ; 62, Wimi-ri(위미리) ; 63, Pomok-ri(보목리) ; 64, Sŏgwip'o(서귀포) ; 65, Chodo(초도) ; 66, Chigwido(지귀도) ; 67, Supto(숲도) ; 68, Mundo(문도) ; 69, Pŏmdo(범도) ; 70, Taep'o(대포) ; 71, Hwasunp'o(화순포) ; 72, Kap'ado(가파도) ; 73, Mosŭlp'o(모슬포) ; 74, Piyangdo(비양도) ; 75, Hallim(환림) ; 76, Taehŭksando(대흑산도) ; 77, Hongdo(홍도) ; 78, Taedundo(대둔도) ; 79, Komso(곰소) ; 80, Kyŏkp'o-ri(격포리) ; 81, Sŏnyudo(선유도) ; 82, Sŏch'ŏn(서천) ; 83, Yŏndo(연도) ; 84, Piin(비인) ; 85, Ŏch'ŏngdo(어청도) ; 86, Taech'ŏn(대천) ; 87, Anmyŏndo(안면도) ; 88, Kyŏk-yŏlbiyŏldo(격열비열도) ; 89, Ch'ŏllip'o(천리포) ; 90, P'almido(팔미도) ; 91, Tŏkchŏkto(덕적도) ; 92, Sorae(소래) ; 93, Songdo(송도) ; 94, Inch'ŏn harbour(인천항) ; 95, Chakyakto(착약도) ; 96, Yŏngjongdo(영종도).

Gymnangium (3), *Macrorhynchia* (1), *Nemertesia* (2), *Sibogella* (1), *Halicornaria* (2), *Pycnotheca* (1), *Plumularia* (8), *Thecocarpus* (2), *Lytocarpus* (2), *Aglaophenia* (2). The purpose of this study is to provide the systematic arrangement of marine hydroids known in Korean fauna up to now and their zoogeographical distribution in Korean waters.

MATERIALS AND METHODS

The total hydroid species and/or subspecies used for this investigation are originated from the previous works on the Korean marine hydroids (Kamita and Sato, 1941; Rho, 1967, 1969; Rho and Chang, 1972, 1974); Rho and Park, 1979, 1980, 1983, 1984, 1986; Park and Rho, 1986; Park, 1988, 1990, 1991). To these *Abietinaria filicula* which is new record in Korean waters is added. They were collected from 96 localities (Fig. 1) of Korean waters during years 1959-1990. For the consideration of zoogeographical distribution, all species and/or subspecies are listed (Table 1). And the Korean waters are divided into four regions: the East Sea, the South Sea, the Yellow Sea and the Chejudo and it's adjacent. Ulgi (Kyöngsangnam-do) included in the East Sea is settled as the boundary between the East Sea and the South Sea, and Chindo included in the South Sea as the boundary between the South Sea and the Yellow Sea. This division is based on the distributive condition of marine hydroids and marine environmental conditions. The community coefficient (r) between two regions of Korean waters was calculated by the following equation for relationship between two regions:

$$r = C / \sqrt{S_1 \cdot S_2} \quad (\text{Kim et al., 1970})$$

C: the number of common species which occurred both corresponding regions simultaneously.

S₁, S₂: the total number of species occurred in each region of pair.

RESULTS AND DISCUSSION

Systematic Accounts

Cnidaria 자포동물 문

Hydrozoa 히드라충 강

Hydroida 히드라충 목

Athecata 민첩히드라충 아강

Family 1. Sphaerocorynidae 둥근곤봉히드라 과

1. *Sphaerocoryne bedoti* Pictet, 1893 베도트곤봉히드라

Record in Korea: Park, 1991 (Mokto, Mijodo).

Family 2. Corynidae 곤봉히드라 과

2. *Coryne pusilla* Gaertner, 1774 곤봉히드라

Records in Korea: Rho, 1969 (Yöngjongdo, Chakyakto, Tolsando); Rho and Chang, 1972 (Ch'ujado); Rho and Chang, 1974 (P'almido, Chakyakto, Naksan).

Family 3. Ptilocodidae 날개히드라 과

3. *Hydrichthella epigorgia* Stechow, 1909 꽃창산호히드라
Record in Korea: Rho and Park, 1979 (Sögwip'o).

Family 4. Solanderiidae 산호불이히드라 과

4. *Solanderia misakinensis* (Inaba, 1892) 큰산호불이히드라
Record in Korea: Rho and Park, 1979 (Mip'o, Hongdo (Yellow Sea))
5. *Solanderia secunda* (Inaba, 1892) 산호불이히드라
Records in Korea: Kamita and Sato, 1941 (Inch'on harbour); Rho and Chang, 1972 (Cheju harbour).

Family 5. Clavidae 진곤봉히드라 과

6. *Turritopsis nutricula* (McCrary, 1856) 작은보호탑히드라
Record in Korea: Park, 1990 (Sögwip'o).

Family 6. Bougainvilliidae 보우젠빌히드라 과

7. *Bimeria vestita* Wright, 1859 덮개히드라
Records in Korea: Rho and Park, 1983 (Chakyakto); Park, 1990 (Chakyakto).

Family 7. Hydractiniidae 축히드라 과

8. *Hydrissa sodalis* (Stimpson, 1859) 집게히드라
Record in Korea: Rho and Park, 1979 (Ch'ungmu, Yokchido, Mip'o).

Family 8. Eudendriidae 꽃히드라 과

9. *Eudendrium tenellum* Allman, 1877 싹꽃히드라
Records in Korea: Rho and Park, 1979 (Gömun-do); Park, 1991 (Naksan, Mip'o, Kyökp'o-ri).
10. *Eudendrium capillare* Alder, 1856 털꽃히드라
Records in Korea: Rho and Park, 1983 (Chakyakto); Park, 1990 (Sögwip'o); 1991 (Chakyakto).
11. *Eudendrium instigne* Hincks, 1868 꽃히드라
Record in Korea: Park, 1991 (Imwon).
12. *Eudendrium carneum* Clarke, 1882 연붉은꽃히드라
Record in Korea: Park, 1991 (Mip'o).

Family 9. Tubulariidae 관히드라 과

13. *Tubularia mesenbryanthemum* Allman, 1872 관히드라
Records in Korea: Rho, 1969 (Taehüksando); Park, 1990 (Söch'ön).

Suborder Thecata 컵히드라충 아목

Family 10. Campanulinidae 작은종히드라 과

14. *Calycella syringa* (Linné, 1767) 연통히드라
Record in Korea: Rho and Park, 1980 (Mip'o).
15. *Modeeria rotunda* (Quoy and Gaimard, 1827) 둥근작은종히드라
Record in Korea: Park, 1988 (Ullüngo).

Family 11. Hebellidae 털히드라 과

16. *Hebella scandens contorta* Marktanner-Turneretscher, 1890 꼬인털히드라
Records in Korea: Rho and Chang, 1972 (Sögwip'o); 1974 (Anmyöndo, Piin); Park, 1990 (Piin, Tökchökto).
17. *Scandia neglecta* (Stechow, 1913) 가는털히드라
Records in Korea: Rho and Park, 1979 (Mip'o, Hongdo (Yellow Sea)); Park, 1990 (Sögwip'o, Nohwado).

Family 20. Haleciidae 무늬히드라 과

18. *Halecium tenellum* Hincks, 1861 연한무늬히드라
Record in Korea: Rho and Chang, 1974 (Sögwip'o, Anmyöndo).
19. *Halecium jaederholmi* Vervoort, 1972 자멜흙무늬히드라
Record in Korea: Rho and Chang, 1974 (Haeundae, Sögwip'o).
20. *Halecium beani* (Johnston, 1838) 둥근무늬히드라
Record in Korea: Park, 1990 (Hoenggando, Mip'o, Sögwip'o).
21. *Halecium pusillum* (M.Sars, 1857) 작은무늬히드라
Record in Korea: Park, 1990 (Sögwip'o); 1991 (Sögwip'o).
22. *Halecium delicatulum* Coughtrey, 1876 매혹무늬히드라
Record in Korea: Rho and Park, 1983 (Sögwip'o).
23. *Hydrodendron armata* (Totton, 1930) 아르마타무늬히드라
Records in Korea: Rho and Park, 1983 (Sögwip'o); Park, 1990 (Ch'öngsando).

24. *Hydrodendron caciniiformis* (Ritchie, 1907) 작은나무무늬히드라
Records in Korea: Rho and Park, 1980 (Gömundo); Park, 1991 (Pogildo, Sögwip'o).

25. *Hydrodendron gardineri* (Jarvis, 1922) 가드너무늬히드라
Record in Korea: Park, 1991 (Sögwip'o).

Family 13. Lafoëidae 바위불이히드라 과

26. *Lafoëa fruticosa* (M. Sars, 1851) 덩불바위불이히드라
Records in Korea: Rho and Chang, 1974 (Supto, Sögwip'o, Yösu, Wimi-ri); Park, 1990 (Mip'o, Nohwado, Sögwip'o, Ch'öngsando, Piyangdo, Kap'ado); Park, 1991 (Sögwip'o, Cheju harbour, Ullüngdo).

27. *Filellum serratum* (Clarke, 1879) 톱니실히드라
Records in Korea: Rho and Chang, 1974 (Yösu, Anmyöndo, Chakyakto); Park, 1990 (Mip'o, Kyökp'o-ri); Park, 1991 (Sögwip'o, Sangch'ujado).

28. *Acryptolaria conferta australis* (Ritchie, 1911) 호주다발히드라
Record in Korea: Park, 1991 (Sögwip'o).

29. *Cryptolaria pectinata* (Allman, 1888) 숨은빗살히드라
Record in Korea: Park, 1989 (Ullüngdo).

30. *Zygophylax biarmata* Billard, 1905 두관절히드라
Records in Korea: Rho and Park, 1984 (Sögwip'o); Park, 1990 (Sögwip'o).

31. *Grammaria abietina* M. Sars, 1851 전나무히드라
Record in Korea: Park, 1991 (Sokch'o).

Family 14. Campanulariidae 종히드라 과

32. *Eucalix paradoxus* Stechow, 1923 컵히드라
Records in Korea: Rho, 1967 (Taehüksando); Rho and Chang, 1974 (Piin); Park, 1990 (Kap'ado).

33. *Campanularia everta* Clarke, 1877 톱니종히드라
Record in Korea: Rho and Chang, 1974 (Anmyöndo).

34. *Orthophyxis platycarpa* Bale, 1914 입넓은종히드라
Records in Korea: Rho, 1967 (Taehüksando); Rho and Chang, 1974 (Haeundae, Sögwip'o, Anmyöndo, Sokch'o); Park, 1990 (Naksan, Chumunjin, Imwon, Chukpyön).

35. *Rhizocaulus chinensis* Marktanner-Turneretscher, 1890 뿌리히드라

Records in Korea: Rho and Park, 1980 (Ullŭngdo, Mip'ŏ, Chakyakto); Park, 1990 (Öch'öngdo, Mip'ŏ, Changho, Samch'önp'ŏ).

36. *Eucopeia crenata* (Hartlaub, 1901) 주걱히드라

Records in Korea: Rho and Park, 1980 (Sögwip'ŏ, Kömundo, Söngsanp'ŏ); Park, 1990 (Taehüksando, Sögwip'ŏ).

37. *Eucopeia caliculata* (Hincks, 1853) 샷대히드라

Records in Korea: Rho and Park, 1980 (Haeundae); Park, 1990 (Kap'ado, Imwon).

38. *Clytia edwardsi* (Nutting, 1901) 에드워드빛히드라

Records in Korea: Rho and Park, 1980 (Yösu); Park, 1990 (Taehüksando).

39. *Clytia johnstoni* (Alder, 1856) 존스톤빛히드라

Record in Korea: Rho and Park, 1980 (Mip'ŏ).

40. *Clytia gracilis* (M. Sars, 1851) 빛히드라

Record in Korea: Rho and Park, 1980 (Taehüksando).

41. *Obelia geniculata* (Linnaeus, 1758) 흑히드라

Records in Korea: Rho, 1967 (Tolsan); 1969 (Tolsan, Haeundae); Rho and Chang, 1972 (Sasudo, Ch'ujado, Sögwip'ŏ); 1974 (Yöngjongdo, Köjedo, Sögwip'ŏ, Piin, Wimi-ri, Yösu); Park, 1990 (Ullŭngdo, Kap'ado, Chukpyöŋ).

42. *Obelia bicuspidata* (Clarke, 1875) 쌍뿔흑히드라

Records in Korea: Rho and Park, 1980 (Chakyakto); 1983 (Komso, Chakyakto, Taehüksando); Park, 1990 (Öch'öngdo, Mip'ŏ, Samch'önp'ŏ).

43. *Obelia dichotoma* (Linnaeus, 1758) 갈래흑히드라

Records in Korea: Rho and Park, 1980 (Yösu, Mip'ŏ, Taehüksando); Park, 1990 (Sangju-ri, Samch'önp'ŏ).

44. *Obelia longissima* (Pallas, 1776) 긴흑히드라

Records in Korea: Rho and Park, 1980 (Taehüksando, Yösu); Park, 1990 (Taejin, Chumunjin, Imwon).

Family 15. Syntheciidae 쌍킵히드라 과

45. *Synthecium tubithecum* (Allman, 1877) 나팔쌍킵히드라

Records in Korea: Rho and Chang, 1974 (Sögwip'ŏ, Odongdo, Yösu); Park, 1990 (Mip'ŏ, Ch'öngsando, Nohwado, Samch'önp'ŏ).

Family 16. Sertulariidae 테히드라 과

46. *Diphastia palmata* Nutting, 1905 넓은입히드라

Records in Korea: Rho and Chang, 1972 (Sögwip'o); 1974 (Chodo, Supto, Sögwip'o, Anmyöndo); Rho and Park, 1986 (Sögwip'o, Pomong-ri, Mip'o); Park, 1990 (Mip'o, Sögwip'o).

47. *Dynamena cristoides* Lamouroux, 1824 민테히드라

Records in Korea: Rho, 1967 (Söngsanp'o); 1969 (Haeundae, Mijo-ri, Kangnüng); Rho and Chang, 1972 (Sasudo, Hoenggando); 1974 (Sögwip'o, Udo, Yundoldo, Köjedo, Sangju-ri); Park and Rho, 1986 (Mokto, Chindo, Yönhwado, Udo, Wando, Shinhüng-ri); Park, 1990 (Küm-odo).

48. *Dynamena cornicina* McCrady, 1858 나팔민테히드라

Record in Korea: Park and Rho, 1986 (Mip'o).

49. *Symplectoscyphus hozawai* Stechow, 1931 호자와테히드라

Records in Korea: Rho, 1967 (Tolsando); 1969 (Mijo-ri); Rho and Chang, 1974 (P'ohang, Sögwip'o, Piin); Park and Rho, 1986 (Mip'o, Chindo, Supto, Yonhwado, Yejakto, Taedundo); Park, 1990 (Taejin, Chumunjin, Imwon).

50. *Abietinaria traski* (Torrey, 1902) 나무테히드라

Record in Korea: Park and Rho, 1986 (Sögwip'o, Pömdo).

51. *Abietinaria filicula* (Ellis and Solander, 1786) 실테히드라(신칭)

(Fig. 2A-D)

Sertularia filicula Ellis and Solander, 1786 (p. 57, pl. 6, fig. C,c) (cited from Cornelius, 1979).

Abietinaria filicula: Fraser, 1944 (p. 240, pl. 50, fig. 224); Naumov, 1969 (pp. 411-412, fig. 272); Cornelius, 1979 (pp. 253-254, fig. 5).

Material examined: Chumunjin, May 26, 1986 (J.I. Song); Sokch'o, Jun. 28, 1989 (J.H. Park); Imwon, Jun. 30, 1989 (J.H. Park).

Description: Colonies below 10cm in height, erect and pinnate. Main stem strait or more or less sinuous in general, divided into regular internodes, but node indistinct, each internode with three hydrothecae and a process for attachment of branch. Branches arise from process on base of each internode of stem, divided into irregular internodes, often branched again, sometimes more than once. Hydrothecae subopposite, adnated 1/3-2/3, arranged in two rows on stem and branches, flask-shaped, bulbous basally, tapering distally to neck and expanding again slightly to aperture, margin smooth, operculum attached to inner side.

Remarks: Unfortunately infertile colonies were collected on the rocks in the eastern coasts of Korea, so that the gonophores were not able to be examined. According to Fraser (1944), gonangia is oval, tapering into a narrow neck above, and into a pedicel, which is somewhat curved, below, and surface is smooth.

Distribution: England (Scarborough, Yorkshire), Grand Manan, new England coast, cape Code to gulf of St. Lawrence, Labrador, White Sea, Barents Sea, Bering Sea, Seas of Okhotsk and Japan, North Atlantic coast of America and Europe to the latitude of central France, North and Norwegian seas, Pacific coast of America and north of California.

52. *Amphisbeta pacifica* Stechow, 1931 태평양테히드라

Records in Korea: Kamita and Sato, 1941 (Inch'on harbour); Rho, 1967 (Sögwip'o, Kömundo); 1969

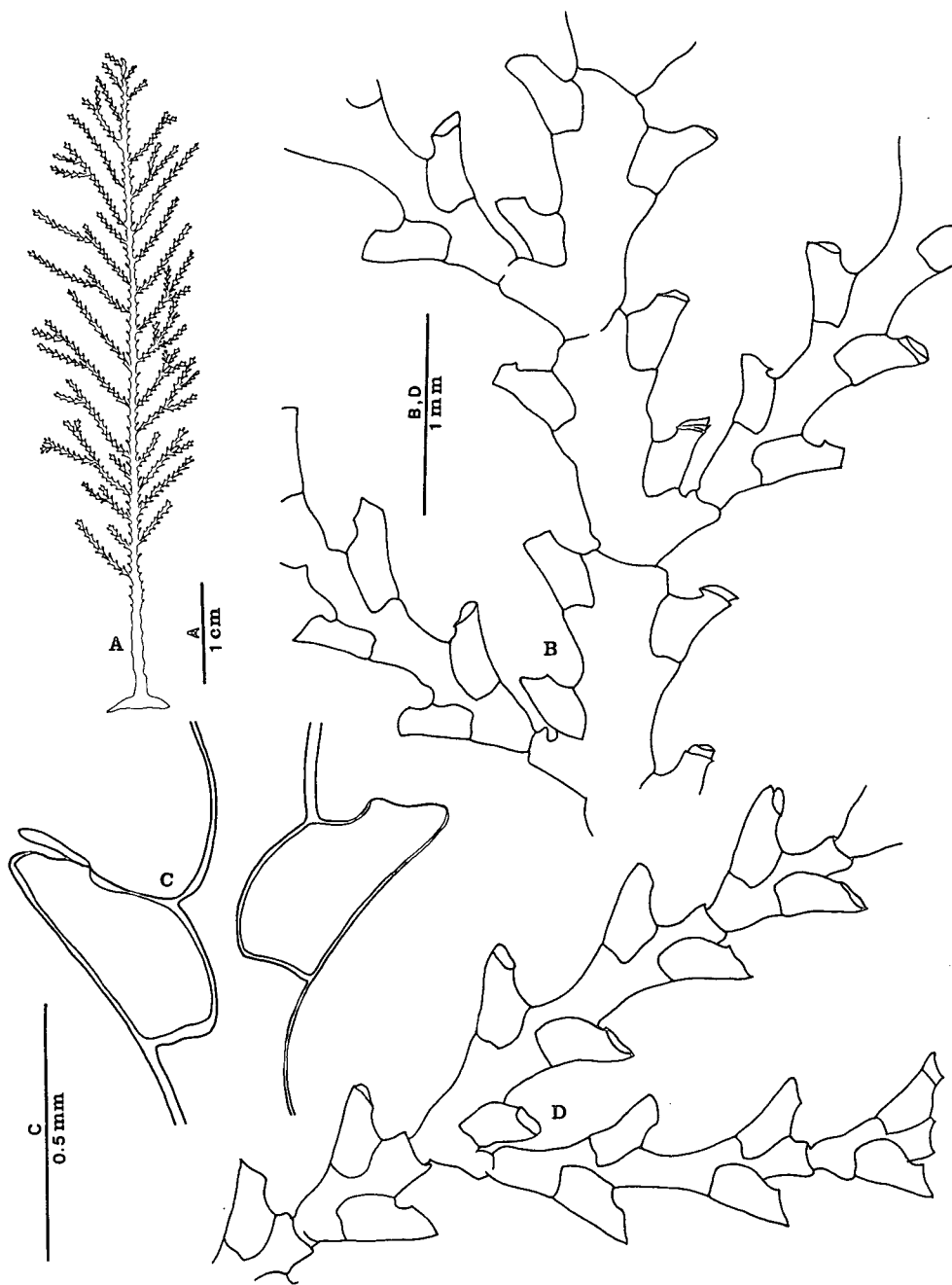


Fig. 2. *Abietinaria filicula*. A, colony; B, stem with branches; C, enlarged hydrothecae; D, dichotomous branch.

(Mijo-ri), Tolsando, Mop'o); Rho and Chang, 1972 (Supto); 1974 (Sögwip'o, Wimi-ri, Yösu, Anmyöndo, Piin); Park and Rho, 1986 (Sögwip'o, Chindo, Kyökp'o-ri, Mokto, Taech'ön, Yejaktö); Park, 1990 (Chumunjün, Imwon).

53. *Pasythea nodosa* Hargitt, 1908 층쌍킵히드라

Records in Korea: Rho, 1967 (Sögwip'o); 1969 (Mijo-ri, Kuryongp'o); Rho and Chang, 1972 (Sögwip'o); 1974 (Mop'o, Sögwip'o); Park and Rho, 1986 (Chindo, Kuryongp'o, Mundo, Sögwip'o).

54. *Sertularia dalmasi* (Versluys, 1899) 달마스화관히드라

Records in Korea: Rho, 1967 (Sögwip'o, Kömundo); Rho and Chang, 1972 (Sögwip'o); 1974 (Söngsanp'o, Sögwip'o, Wimi-ri, Piin); Park and Rho, 1986 (Sögwip'o, Hongdo (South Sea)).

55. *Sertularia hattorii* Leloup, 1940 하또리화관히드라

Records in Korea: Rho and Chang, 1972 (Sögwip'o); 1974 (Hoenggando, Sögwip'o); Park and Rho, 1986 (Sögwip'o).

56. *Sertularia densa* Stechow, 1919 땡땡화관히드라

Records in Korea: Rho and Park, 1983 (Odongdo); Park and Rho, 1986 (Hoenggando, Yösu, Piin).

57. *Sertularia turbinata* (Lamouroux, 1816) 윈빨화관히드라

Record in Korea: Park and Rho, 1986 (Yönhwado).

58. *Sertularia distans* (Lamouroux, 1816) 화관히드라

Records in Korea: Rho and Park, 1980 (Sögwip'o, Hongdo (South Sea), Kaldo); Park and Rho, 1986 (Pömdo, Sögwip'o, Mip'o).

59. *Sertularia desmoides* Torrey, 1902 사슬화관히드라

Record in Korea: Park and Rho, 1986 (Anmyöndo, Taehöksando, Hongdo (South Sea)).

60. *Sertularella lagenoides* Stechow, 1919 플라스크테히드라

Records in Korea: Rho and Chang, 1972 (Sasudo); 1974 (Öch'öngdo, Yundoldo, Mijo-ri, Sokch'o); Park and Rho, 1986 (Taedundo).

61. *Sertularella arey* Nutting, 1904 아레이테히드라

Record in Korea: Rho and Chang, 1974 (Sögwip'o).

62. *Sertularella gotoi* Stechow, 1913 고평테히드라

Records in Korea: Rho and Chang, 1974 (Yösu, Sögwip'o, Anmyöndo); Park and Rho, 1986 (Anmyöndo, Mip'o, Toch'öng-ri, Ullöngdo); Park, 1990 (Mip'o, Ch'öngsando, Chumunjün).

63. *Sertularella solidula* Bale, 1882 단단테히드라

Records in Korea: Rho and Park, 1983 (Sögwip'o); Park and Rho, 1986 (Kyökp'o-ri, Yokchido,

Taehüksando, Kōmundo, Yesong-ri, Shinhūng-ri).

64. *Sertularella sinensis* Jäderholm, 1896 그물테히드라

Records in Korea: Rho and Chang, 1974 (Sōgwip'o, Yōsu); Park and Rho, 1986 (Cheju harbour, Mip'o, Sōgwip'o, Supto, Pusan harbour, Toch'ōng-ri, Pōmdo); Park, 1990 (Mip'o, Chumunjin).

65. *Setularella pedrensis* Torrey, 1904 자루테히드라

Record in Korea: Park and Rho, 1986 (Nohwado).

66. *Sertularella distans* (Allman, 1877) 분리테히드라

Records in Korea: Park and Rho, 1986 (Sōgwip'o); Park, 1990 (Sōgwip'o).

67. *Sertularella gayi* Lamouroux, 1827 가이테히드라

Records in Korea: Park and Rho, 1986 (Chakyakto); Park, 1990 (Mip'o, Ch'ōngsando).

68. *Sertularella gigantea* Mereschkowsky, 1878 큰테히드라

Record in Korea: Park, 1990 (Imwon).

69. *Sertularella levigata* Stechow, 1931 테히드라

Records in Korea: Rho, 1967 (Sōngsanp'o, Sōgwip'o, Kōmundo, Tolsando; 1969 (Tolsando, Haeundae, Sangju-ri, Kangnūng, Chindo); Rho and Chang, 1972 (Supto); Park and Rho, 1986 (Mijodo, Chindo, Sōgwip'o, Ōch'ōngdo, Sōngsanp'o, Yesong-ri, Sangju-ri, P'ohang, Samch'ōnp'o); Park, 1990 (Kap'ado, Chumunjin).

70. *Sertularella miurensis* Stechow, 1921 가로테히드라

Records in Korea: Rho, 1967 (Sōgwip'o, Tolsando, Taehüksando); 1969 (Tolsando, Haeundae, Mijo-ri, Nodo, Kuryongp'o); Rho and Chang, 1974 (Sōgwip'o, Piin, Ōch'ōngdo, Wimi-ri, Kamp'o, Odongdo, Yōsu, Anmyōndo, Sokch'o); Park and Rho 1986 (Sōgwip'o, Kōjedo, Anmyōndo, Haeundae, Mijodo, Sangju-ri, Mokto, Chindo, Sōngsanp'o, Kyōkp'o-ri, Komso, Pōmdo, Yōsōdo, Mip'o, Taech'ōn, Pijindo, Kūndōk); Park, 1990 (Ōch'ōngdo, Ullūngdo, Taejin, Ch'umunjin, Samch'ōk, Imwon, Sokch'o).

71. *Sertularella obtusa* Stechow, 1931 무단테히드라

Records in Korea: Park and Rho 1986 (Anmyōndo, Chindo, Taehüksando, Sōgwip'o); Park, 1990 (Naksan, Ch'ukpyōn).

72. *Sertularella quinquelaminata* Stechow, 1931 오겹테히드라

Records in Korea: Rho, 1967 (Kōmundo); Park and Rho, 1986 (Tolsando, Mijo-ri, Sōgwip'o, Shinsudo); Park, 1990 (Ch'akyakto, Ch'umunjin).

73. *Sertularella robusta* Coughtrey, 1876 붉은테히드라

Records in Korea: Rho and Park, 1980 (Kōmundo); Park and Rho, 1986 (Ch'akyakto, Sōngsanp'o, Shinhūng-ri); Park, 1990 (Ch'akyakto, Ch'umunjin).

74. *Sertularella tenella* (Alder, 1856) 연테히드라
Records in Korea: Park and Rho, 1896 (Ch'akyakto, Yöndo, Mip'o, Pömdo); Park, 1990 (Ch'akyakto).
75. *Sertularella tongensis* Stechow, 1919 통가테히드라
Records in Korea: Park and Rho, 1986 (Ch'öngsa, Mundo); Park, 1990 (Sögwip'o).
76. *Thutaria nuttingi* (Levinsen, 1912) 누팅테히드라
Records in Korea: Park and Rho, 1986 (Yösu, Pömdo, Mip'o, Kuryongp'o, Supto).
77. *Thutaria similis* (Clarke, 1876) 의테히드라
Record in Korea: Park and Rho, 1986 (Sögwip'o, Mip'o, Samch'önp'o).
78. *Thutaria articulata* (Pallas, 1766) 관절테히드라
Record in Korea: Park and Rho: 1986 (Supto).
79. *Thutaria carica* Levinsen, 1893 사초테히드라
Record in Korea: Park and Rho, 1986 (Sögwip'o, Kuryongp'o).
80. *Thutaria cupressina* (Lennaeus, 1758) 검정테히드라
Records in Korea: Rho and Park, 1980 (Kyöng-yölbijöldo); Park and Rho, 1986 (Öch'öngdo, Kyöng-yölbijöldo, Pusan harbour, Anmyöndo).
81. *Thutaria argentea* (Linnaeus, 1758) 아르헨틴테히드라
Records in Korea: Rho and Park, 1980 (Mip'o); Park and Rho, 1986 (Mip'o, Oryukto, Nohwado, Samch'önp'o).
82. *Thutaria suensoni* (Levinsen, 1912) 수엔손테히드라
Record in Korea: Park and Rho, 1986 (Aninjin, Ch'uksan); Park, 1990 (Imwon).
83. *Thutaria thuja* (Linnaeus, 1758) 두자테히드라
Record in Korea: Park and Rho, 1986 (Ch'akyakto, Mip'o).
84. *Thutaria plumosa* Clarke, 1876 깃테히드라
Record in Korea: Park and Rho, 1986 (Sögwip'o).
85. *Selaginopsis trilateralis* Fraser, 1936 벽돌테히드라
Record in Korea: Park and Rho, 1986 (Yokchido, Yösu, Kuryongp'o, Mip'o, Sangju-ri).
86. *Selaginopsis triserialis* Mereschkowsky, 1878 비단테히드라
Record in Korea: Park and Rho, 1986 (Kyöng-yölbijöldo, Mip'o, Taech'ön).

87. *Selaginopsis pinnata* Mereschkowsky, 1878 우모테히드라

Record in Korea: Park and Rho, 1986 (Sorae, Sangju-ri).

88. *Selaginopsis cornigera* (Kudelin, 1914) 빨테히드라

Record in Korea: Park and Rho, 1986 (Yöndo, Songdo, Ch'akyakto, Sangju-ri, Pusan harbour, Anmyöndo).

Family 17. Plumulariidae 깃히드라 과

89. *Halopteris constricta* Totton, 1930 수축깃히드라

Record in Korea: Park, 1990 (Sögwip'o, Sokch'o).

90. *Antennella diaphana siliquosa* (Hincks, 1877) 꼬투리깃히드라

Records in Korea: Rho and Park, 1980 (Sögwip'o); Rho and Park, 1986 (Mundo, Sögwip'o); Park, 1990 (Kapado).

91. *Antennella secundaria* Gmelin, 1789 둘째깃히드라

Records in Korea: Rho, 1967 (Sögwip'o); Rho and Chang, 1972 (Sögwip'o, Supto, Mundo); 1974 (Sögwip'o, Ch'akyakto, Anmyöndo); Rho and Park, 1986 (Sögwip'o, Chindo, Kuryongp'o, Ch'akyakto, Yokchido, Hongdo (South Sea), Yejakto); Park, 1990 (Ch'öllip'o, Sögwip'o).

92. *Antennella africana* Broch, 1914 아프리카깃히드라

Records in Korea: Rho, 1967 (Kömdo); 1969 (Haeundae, Kangnüng); Rho and Chang, 1972 (Hoenggando); 1974 (Sögwip'o, Wimi-ri, Udo, Odongdo, Anmyöndo, Naksan, Ch'akyakto); Rho and Park, 1986 (Hoenggando, Taehüksando, Mip'o, Sögwip'o, Udo).

93. *Antennella integerrima* (Jäderholm, 1896) 둥글깃히드라

Records in Korea: Rho and Chang, 1972 (Sögwip'o, Pömdo); 1974 (Sögwip'o); Rho and Park, 1986 (Sögwip'o, Taep'o).

94. *Monotheca obliqua* (Johnston, 1847) 외틀이깃히드라

Records in Korea: Rho, 1967 (Yösu); 1969 (Yöngjongdo); Rho and Chang, 1974 (Mijo-ri); Rho and Park, 1986 (Hoenggando, Sögwip'o).

95. *Monostaechas quadridens* (McCrary, 1857) 네주름깃히드라

Records in Korea: Rho and Chang, 1972 (Sögwip'o); 1974 (Mundo, Sögwip'o); Rho and Park, 1986 (Sögwip'o).

96. *Kirchenpaueria pinnata similis* (Hincks, 1861) 날개깃히드라

Record in Korea: Rho and Park, 1986 (?).

97. *Gymnangium hians* (Busk, 1852) 민숭이깃히드라

Records in Korea: Rho, 1967 (Sögwip'o); Rho and Chang, 1972 (Sögwip'o); 1974 (Supto, Chigwido, Sögwip'o, Wimi-ri); Rho and Park, 1986 (Sögwip'o, Wimi-ri, Pömdo, Mip'o, Mundo).

98. *Gymnangium eximium* (Allman, 1874) 특수깃히드라

Records in Korea: Rho and Park, 1986 (Sögwip'o).

99. *Gymnangium roretzi* (Marktanner, 1890) 로레저깃히드라

Record in Korea: Rho and Park, 1986 (Sögwip'o, Mundo).

100. *Macrorhynchia phoenicea* (Busk, 1852) 자색깃히드라

Records in Korea: Rho, 1967 (Sögwip'o); Rho and Chang, 1972 (Sögwip'o, Supto, Mundo, Pömdo); 1974 (Chigwido, Sögwip'o, Wimi-ri); Rho and Park, 1986 (Sögwip'o, Supto, Mundo, Mip'o, Udo, P'yosön, Mosülp'o, Taep'o).

101. *Nemertesis antennina* (Linnaeus, 1758) 촉각깃히드라

Records in Korea: Rho and Park, 1983 (Sögwip'o); Rho and Park, 1986 (Sögwip'o).

102. *Nemertesis polygeniculata* Rho and Park, 1984 다관절깃히드라

Record in Korea: Rho and Park, 1984 (Ullüngdo, Sögwip'o, Mip'o).

103. *Sibogella erecta* Billard, 1911 곤두깃히드라

Record in Korea: Rho and Park, 1986 (Sögwip'o, Wimi-ri).

104. *Halicornaria expansa* Jäderholm, 1903 넓적고래수염깃히드라

Records in Korea: Rho and Park, 1980 (Pusan harbour); Rho and Park, 1986 (Sögwip'o).

105. *Pycnotheca mirabilis* (Allman, 1883) 질긴컵히드라

Records in Korea: Rho, 1967 (Sögwip'o, Sönyudo); Rho and Chang, 1972 (Sögwip'o); 1974 (Sögwip'o, Supto, Wimi-ri); Rho and Park, 1986 (Wimi-ri, Mip'o, Kuryongp'o, Sögwip'o, Samch'önp'o); Park, 1990 (Kap'ado, Ch'umunjin).

106. *Halicornaria twisti* Rho and Park, 1984 꼬인깃히드라

Record in Korea: Rho and Park, 1984 (Sögwip'o, Pusan harbour).

107. *Plumularia hertwigi* Stechow, 1907 헤르트비히깃히드라

Records in Korea: Rho and Park, 1983 (Sögwip'o); Rho and Park, 1986 (Wimi-ri, Hongdo (South Sea)).

108. *Plumularia filicaulis* Kirchenpauer, 1876 고비깃히드라

Records in Korea: Rho and Park, 1986 (Sögwip'o); Park, 1990 (Kap'ado, Sokch'o).

109. *Plumularia filicaulis japonica* Jäderholm, 1919 왜고비깃히드라

Records in Korea: Rho and Park, 1980 (Kömundo, Haegümgang); 1986 (Chigwido, Mip'o, Udo, Sögwip'o).

Pomong-ri, Hwasunp'o).

110. *Plumularia pennycuikai* Millard et Bouillon, 1973 페니깃히드라

Records in Korea: Rho and Park, 1980 (Ch'akyakto); 1986 (Yöngjongdo, Sögwip'o, Ch'akyakto, Ullüngdo, Taech'ön); Park, 1990 (Tökchökto).

111. *Plumularia spinulosa* Bale, 1882 가시깃히드라

Record in Korea: Rho and Park, 1986 (Mip'o).

112. *Plumularia setacea* (Linnaeus, 1758) 깃히드라

Records in Korea: Rho, 1967 (Kömundo); 1969 (Tolsan, Haeundae); Rho and Chang, 1972 (Sögwip'o); 1974 (Sögwip'o, Hallim, Wimi-ri); Rho and Park, 1986 (Wimi-ri, Anmyöndo, Naksan, Kuryongp'o, Sögwip'o, Taehüksando, Mip'o).

113. *Plumularia spiralis* Billard, 1911 나사깃히드라

Records in Korea: Rho, 1969 (Sögwip'o); Rho and Chang, 1972 (Supto, Mundo); Rho and Park, 1986 (Sögwip'o).

114. *Plumularia lagenifera* Allman, 1886 플라스크깃히드라

Records in Korea: Rho and Park, 1980 (Söngsanp'o); 1986 (Songjöng, Sögwip'o).

115. *Thecocarpus myriophyllum orientalis* Billard, 1908 동양협깃히드라

Record in Korea: Park, 1990 (Sögwip'o).

116. *Thecocarpus niger* Nutting, 1906 검정깃히드라

Records in Korea: Rho, 1967 (Sögwip'o, Hallim, Kömundo, Sönyudo); Rho and Chang, 1972 (Sögwip'o); 1974 (Sögwip'o); Rho and Park, 1986 (Sögwip'o, Samch'önp'o, P'yosön, Mosülp'o, Hwasunp'o, P'ohang).

117. *Lytocarpus philippinus* (Kirchenpauer, 1847) 필리핀깃히드라

Records in Korea: Rho, 1967 (Sögwip'o); Rho and Chang, 1972 (Sögwip'o); 1974 (Sögwip'o); Rho and Park, 1986 (Sögwip'o, Mundo).

118. *Lytocarpus secundus* (Kirchenpauer, 1872) 제이깃히드라

Record in Korea: Rho and Park, 1986 (Oryukto, Taep'o).

119. *Aglaophenia whiteleggei* Bale, 1888 흰깃히드라

Records in Korea: Kamita and Sato, 1941 (Inch'ön harbour); Rho, 1969 (Mijo-ri, Yokchido); Rho and Chang, 1972 (Hoenggando, Sögwip'o); 1974 (Piin, Yösu); Rho and Park, 1986 (Supto, Sögwip'o, Mip'o, Ch'ölip'o, Chindo, Yöng-ilman, Hongdo (Yellow Sea), Nohwado, Taedundo, Samch'önp'o, P'ohang, Mosülp'o, Tökchökto); Park, 1990 (Mip'o).

120. *Aglaophenia suensoni* Jäderholm, 1896 주발깃히드라

Table 2. The number of common species occurred both corresponding regions simultaneously and the community coefficient(r) between two regions

	Common species	Community coefficient
East Sea - Yellow Sea	21	0.444
East Sea - South Sea	31	0.553
East Sea - Chejudo and it's vicinity	31	0.519
Yellow Sea - South Sea	42	0.682
Yellow Sea - Chejudo and it's vicinity	35	0.533
South Sea - Chejudo and it's vicinity	50	0.642

Records in Korea: Rho, 1967 (Sögwip'o); 1969 (Tolsan, Yokchido); Rho and Park, 1972 (Sasudo, Sögwip'o, Pömdo, Chigwido); 1974 (Chodo, Supto, Sögwip'o, Wimi-ri); Rho and Park, 1986 (Kuryongp'o, Haeundae, Mip'o, Sögwip'o, Yokchido, Ch'ungmu, Haegümgang, Samch'önp'o, Taep'o).

Concerning the total number of species occurred each region, 43 species occur in the East Sea, 52 species in the Yellow Sea, 73 species in the South Sea and 83 species in the Chejudo and its vicinity (Table 1). Total number of species shared between two regions and the community coefficients given in parenthesis are 21 species (0.444) shared between the East Sea and the Yellow Sea, 31 species (0.553) between the East Sea and the South Sea, 31 species (0.519) between the East Sea-the Chejudo and its vicinity, 42 species (0.682) between the the Yellow Sea and the South Sea, 35 species (0.533) between the Yellow Sea and the Chejudo and its vicinity, and 50 species (0.642) between the South Sea and the Chejudo and its vicinity (Table 2). From the above results, it can be said that the Chejudo and its vicinity show the most diversity of the Korean marine hydroids. This fact is probably due to the fact that Chejudo and its vicinity are located in the influence of the North Equatorial Current. So that the zoogeographical relationship of the Yellow Sea-the South Sea is highest and that of the East Sea-the Yellow Sea is the lowest on the hydroid distribution. This is not coincided with the zoogeographical relationship between two regions on the Scleractinia (Song, 1991), which is probably due to the difference of the habitats between hydroids and scleractinians.

ABSTRACT

The Korean marine hydroid fauna identified up to date consists of 120 species of 55 genera in 17 families. Of which *Abietinaria filicula* (Ellis and Solander, 1786) is new to the Korean fauna, and the dominant species of hydroids in Korean waters is *Sertularella miurensis* Stechow, 1921 which is collected from 33 points of 96 localities. The coastal waters of Korea are divided into four regions: the East Sea, the South Sea, the Yellow sea and the Chejudo. Concerning the total number of species occurred in each region, 43 species in the East Sea, 52 species in the Yellow Sea, 73 species in the South Sea and 83 species

in the Chejudo and its vicinity. From the results above described it can be said that the Chejudo region shows the most diversity of the Korean hydroids. The community coefficient of the East Sea-the Yellow Sea is 0.444, that of the East Sea-the South Sea 0.553, that of the East Sea-Chejudo 0.519, that of the Yellow Sea-the South Sea 0.682, that of the Yellow Sea-the Chejudo 0.533 and that of the South Sea-the Chejudo 0.642. So that the zoogeographical relationship between the Yellow Sea and the South Sea is the highest and between the East Sea and the Yellow Sea is the lowest on the hydroids distribution.

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