

Coastal Mantle Communities in South Korea and Japan

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ABSTRACT : A research on the coastal mantle communities in South Korea and Japan was carried out. This study was accomplished by using syntaxa and hierarchical system of the coastal mantle communities in South Korea and Japan in terms of the Zürich-Montpellier School's method. The coastal mantle communities in South Korea and Japan are included in the *Rosetalia rugosae* of northern type and the *Viticetea rotundifoliae* of southern type, which are characterized by *Rosa rugosa* and *Vitex rotundifolia*, respectively. The coastal mantle communities in South Korea are subordinated and are considerably corresponded to those which already identified in Japan. Each syntaxon of the coastal mantle communities in South Korea and Japan is briefly characterized floristically and ecologically, and their distribution is shown on maps.

Key Words: Coastal mantle community, *Rosetalia rugosae*, *Viticetea rotundifoliae*.

INTRODUCTION

Mantle communities (forest-edge community; mantelgesellschaften) are usually built up with summergreen scrambling scrubs, thorny and liana plants in front of the adjacent forests (Jakucs 1970, Miyawaki 1972, Wilson and Lee 1989). These mantle communities are basically formed by natural disturbances and/or anthropogenic interferences according to strong and continuous human impacts (Miyawaki *et al.* 1968). Generally, mantle communities are developed at the margin of forests adjacent to open spaces such as grasslands, croplands, cutting areas, forest fire areas, streams and coastlines because of the optimal growth under full sunlight conditions (Miyawaki 1967, Tüxen 1972). In Japan, after the first phytosociological study about mantle vegetation in 1973 (Ohba *et al.* 1973), a number of syntaxonomical researches about mantle vegetation were carried out by many phytosociologists (Murakami 1991, Nakanishi 1984, Nakanishi and Nakagoshi 1975, Ohba and Sugawara 1980). Consequently, all syntaxa and hierarchical system of mantle vegetation were accomplished throughout whole Japanese Archipelago (Miyawaki *et al.* 1994). On the other hand, the first phytosociological study about mantle vegetation in South Korea was carried out in 1994 (Jung *et al.* 1994). Since then, many phytosociological studies about mantle vegetation have been studied, but all of the researches were concentrated on inland type of mantle vegetation (Jung 1995, Jung and Kim 1998a, 1998b, 1998c). While the inland type of mantle vegetation is quite well-known in South Korea, its coastal type is still unknown except by a few

physiological and ecological studies (Kim 1983, Kim and Song 1983, Lee and Chon 1983, 1984). Therefore, the purpose of this study is to find out hierarchical system, synecology, syndynamics and synegeography of each coastal mantle community in South Korea and Japan in terms of the comparative analysis throughout the syntaxonomy of coastal mantle vegetation in the two countries.

STUDY SITES AND METHODS

The study area is South Korea and Japan which are located geographically in the neighborhood within the Far Eastern end of Asiatic Continent. The location of the study area is 24° 11' ~ 45° 32' in latitude and 123° 00' ~ 145° 47' in longitude (Figs. 1, 2). South Korea and Japan are mostly surrounded by seas with the consequence that coastal vegetation were well-developed except for some rocky and marsh areas of southern and western coastlines in South Korea. The climate of the study area is meteorologically characterized by *Cf*, *Dw* and *Df* of temperate climate in terms of Köppen's climatic province (Tagawa 1982). And the study area is synegeographically subordinated to the *Querco-Fagetea crenatae* Miyawaki *et al.* 1968 *em.* Kim J.-W. 1992, representing temperate forests of Northeast Asia (Miyawaki *et al.* 1968, Kim 1990, 1992). South Korea is syntaxonomically matched by the *Rhododendro-Quercetalia mongolicae* Kim J.-W. 1990 in the *Quercenea mongolicae* Kim J.-W. 1992. On the other hand, Japan is syntaxonomically matched by the *Quercetalia serrato-grosseserratae* Miyawaki *et al.* 1971 *em.* Kim J.-W. 1991, the *Fagetalia multinervis* Kim

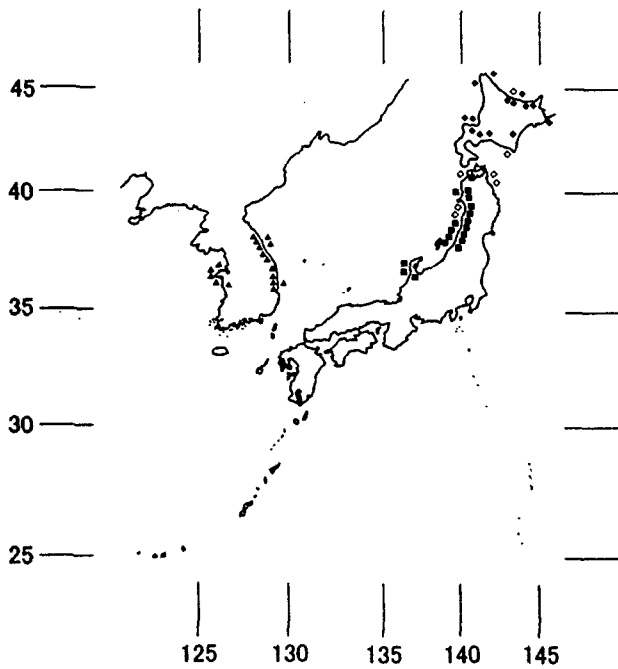


Fig. 1. Distribution of the Rosetalia rugosae (▲ = Rosa rugosa community, ◆ = Viti-Rosetum rugosae, ◇ = Roso-Juniperetum confertae and ■ = Elaeagno-Rosetum rugosae).

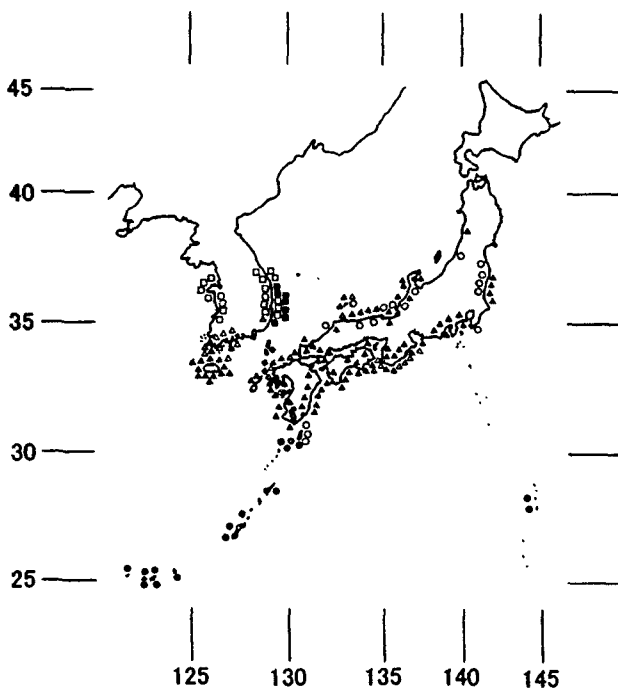


Fig. 2. Distribution of the Viticetea rotundifoliae (□ = Vitex rotundifolia community, ■ = Linario-Viticetum rotundifoliae, ▲ = Imperato-Viticetum rotundifoliae, △ = Roso-Viticetum rotundifoliae, ○ = Vitici-Juniperetum confertae, ◆ = Vitici-Juniperetum procumbentis and ● = Thuareio-Viticetum rotundifoliae).

et al. 1987, the Saso-Fagetalia crenatae Suz.-Tok. ex Miyawaki et al. 1968 and the Abieti sachalinensis-Quercetalia grosseserratae Kim J.-W. 1992 in the Fagenea crenatae Miyawaki et al. ex Miyawaki et al. 1968 stat. Kim J.-W. 1992 (Kim 1990, 1992, 1993). Therefore, the vegetation of Japan is much more diversified than that of South Korea.

In the present study, coastal mantle communities which were distinguished by the classical block-structure seeking and hand-sorting method in terms of the Zürich-Montpellier School were used (Becking 1957, Braun-Blanquet 1964). These data were collected under the prudent consideration of species composition and species dynamics of scrambling pioneer species in coastal mantle vegetation (Moravec 1971). For that reason, the most typical and homogeneous communities and hierarchical system of coastal mantle vegetation in South Korea (Jung, in review) and Japan (Miyawaki et al. 1994, Miyawaki and Okuda 1990) were selected and used in this study. Syntaxonomy, synecology, syndynamics and syneogeography of each coastal mantle community in South Korea and Japan were discussed and described. Vegetation unit and hierarchical system were considered on the basis of International Code of Nomenclature (Barkman et al. 1986), and species names followed Lee (1979).

RESULTS AND DISCUSSION

Coastal mantle communities in South Korea and Japan are classified into the Rosetalia rugosae Ohba, Miyawaki et Tx. 1973 in the Rosetia multiflorae Ohba, Miyawaki et Tx. 1973 representing the mantle vegetation of Northeast Asia (Ohba et al. 1973). This order is characterized by Rosa rugosa, and is the representative of northern coastal mantle vegetation. The Rosetalia rugosae in South Korea and Japan subordinates the Rosion rugosae Ohba, Miyawaki et Tx. 1973 in all (Table 1). And coastal mantle communities in South Korea and Japan are also included in the Viticetea rotundifoliae Ohba, Miyawaki et Tx. 1973 representing the southern coastal mantle vegetation of Northeast Asia (Ohba et al. 1973). This class is characterized by Vitex rotundifolia. The Viticetea rotundifoliae of South Korea subordinates 2 alliances of the Ischaemo-Viticion rotundifoliae Ohba, Miyawaki et Tx. 1973 and the Roso-Viticion rotundifoliae Nakanishi 1979. On the other hand, that of Japan subordinates 3 alliances of the Ischaemo-Viticion rotundifoliae Ohba, Miyawaki et Tx. 1973, the Roso-Viticion rotundifoliae Nakanishi 1979 and

Table 1. Hierarchical system of coastal mantle communities in South Korea and Japan

Region	South Korea	Japan
Syntaxa		
Rosetalia rugosae	Rosion rugosae <i>Rosa rugosa</i> community	Rosion rugosae Viti-Rosetum rugosae Roso-Juniperetum confertae Elaeagno-Rosetum rugosae Roso-Maletum mandshuricae Potentillo-Rosetum rugosae
Viticetea rotundifoliae	Ischaemo-Viticion rotundifoliae <i>Vitex rotundifolia</i> community Linario-Vitacetum rotundifoliae Imperato-Vitacetum rotundifoliae Roso-Viticion rotundifoliae Roso-Vitacetum rotundifoliae	Ischaemo-Viticion rotundifoliae Linario-Vitacetum rotundifoliae Imperato-Vitacetum rotundifoliae Vitici-Juniperetum confertae Vitici-Juniperetum procumbentis <i>Lathyrus japonicus-Rosa wichuraiana</i> community <i>Vitex rotundifolia-Elaeagnus umbellata</i> community Roso-Viticion rotundifoliae Roso-Vitacetum rotundifoliae Thuareio-Viticion rotundifoliae Thuareio-Vitacetum rotundifoliae Wedelietum biflorae

the Thuareio-Viticion rotundifoliae Miyawaki *et al.* K. Suzuki 1976 (Miyawaki *et al.* 1994, Nakanishi 1979, 1981; Table 1).

Rosion rugosae Ohba, Miyawaki *et al.* 1973

The Rosion rugosae in the Rosetalia rugosae is a summergreen scrub which is characterized by *Rosa rugosa*. This alliance is mostly developed between coastal sand dunes and coastal wind-break forest, and widely distributed northern part of South Korea and Japan (Fig. 1). But the Rosion rugosae of the two countries are completely different in the syntaxa and species composition (Table 2, 3). The Rosion rugosae of South Korea subordinates *Rosa rugosa* community, but that of Japan is divided into 5 associations of the Viti-Rosetum rugosae, the Roso-Juniperetum confertae, the Elaeagno-Rosetum rugosae, the Roso-Maletum mandshuricae and the Potentillo-Rosetum rugosae (Table 1).

Rosa rugosa community

Rosa rugosa community is a summergreen scrub which is characterized by the differential

species of *Rosa rugosa* (Table 2). Vegetation of this community has a mono-layered structure and its height is about 0.4~1.2m in general. This community does not share any common diagnostic species of higher units, and the stands are totally dominated by one species of *Rosa rugosa*. This community is developed naturally at somewhat unstable sand dunes and banks beside beaches, and mostly located between the Elymo-Caricetum kobomugi of front coastal sand dune community and *Pinus thunbergii* forest of inland windbreak. The distribution of this community is restricted to above 36°N in latitude of cool-temperate region in South Korea (Fig. 1).

Viti-Rosetum rugosae Ohba, Miyawaki *et al.* 1973

The Viti-Rosetum rugosae is a summergreen scrub which is characterized by the differential species of *Vitis coignetiae*, *Carex pumila* and *Miscanthus sinensis* (Table 3). Vegetation of this association has a mono-layered structure with its height about 0.4~0.8 m in general. The Viti-

Table 2. Diagnostic species group of coastal mantle communities in South Korea

Syntaxa	Diagnostic species group
Rosetalia rugosae <i>Rosa rugosa</i> community	<i>Rosa rugosa</i>
Viticetea rotundifoliae <i>Vitex rotundifolia</i> community	<i>Vitex rotundifolia</i> , <i>Ischaemum antheophoroides</i>
Linario-Vitacetum rotundifoliae	<i>Linaria japonica</i> , <i>Artemisia capillaris</i>
Roso-Vitacetum rotundifoliae	<i>Rosa wichuraiana</i> , <i>Lonicera japonica</i> , <i>Paederia scandens</i>
Imperato-Vitacetum rotundifoliae	<i>Imperata cylindrica</i> var. <i>koenigii</i> , <i>Zoysia macrostachya</i>

Table 3. Diagnostic species group of coastal mantle communities in Japan

Syntaxa	Diagnostic species group
Rosetalia rugosae	
Viti-Rosetum rugosae	<i>Vitis coignetiae</i> , <i>Carex pumila</i> , <i>Miscanthus sinensis</i>
Roso-Juniperetum confertae	<i>Juniperus conferta</i>
Elaeagno-Rosetum rugosae	<i>Elaeagnus umbellata</i> , <i>Carex breviculmis</i> var. <i>fibrillosa</i> , <i>Viola senaminensis</i> , <i>Vitis ficifolia</i> var. <i>lobata</i> , <i>Zoysia japonica</i> , <i>Ischaemum antheboroides</i> , <i>Moehringia lateriflora</i>
Roso-Maletum mandshuricae	<i>Malus baccata</i> var. <i>mandshurica</i>
Potentillo-Rosetum rugosae	<i>Potentilla fragarioides</i> , <i>Adenophora triphylla</i> var. <i>japonica</i> , <i>Geranium yezoensis</i> var. <i>pseudopalustre</i> , <i>Festuca rubra</i> , <i>Ligusticum hultenii</i>
Viticetea rotundifoliae	
Linario-Viticetum rotundifoliae	<i>Linaria japonica</i> , <i>Artemisia capillaris</i>
Imperato-Viticetum rotundifoliae	<i>Imperata cylindrica</i> var. <i>koenigii</i> , <i>Zoysia macrostachya</i>
Vitici-Juniperetum confertae	<i>Juniperus conferta</i> , <i>Indigofera pseudotinctoria</i>
Vitici-Juniperetum procumbentis	<i>Juniperus chinensis</i> var. <i>procumbens</i> , <i>Celastrus orbiculatus</i> var. <i>punctatus</i>
<i>Lathyrus japonicus</i> - <i>Rosa wichuraiana</i> community	<i>Rosa wichuraiana</i>
<i>Vitex rotundifolia</i> - <i>Elaeagnus umbellata</i> community	<i>Elaeagnus umbellata</i>
Roso-Viticetum rotundifoliae	<i>Rosa wichuraiana</i> , <i>Ampelopsis brevipedunculata</i> , <i>Lonicera japonica</i> , <i>Paederia scandens</i>
Thuareio-Viticetum rotundifoliae	<i>Thuarea involuta</i> , <i>Ipomoea pescaprae</i>
Wedelietum biflorae	<i>Wedelia biflora</i>

Rosetum rugosae is dominated by *Rosa rugosa*, and is mixed with *Celastrus orbiculatus* var. *strigillosus*, *Rubus parvifolius*, *Elymus mollis*, *Lathyrus japonicus*, *Galium verum* var. *asiaticum*, *Festuca rubra*, *Poa pratensis*, *Moehringia lateriflora* and *Linaria japonica*. The association appears naturally at the rear part of coastal sand dunes, and develops between the *Glehnieta littoralis* of front coastal sand dune communities and *Quercus dentata* forest of inland windbreak. The distribution of this association is restricted to Hokkaido in Japan (Fig. 1).

Roso-Juniperetum confertae Ohba, Miyawaki et Tx. 1973

The Roso-Juniperetum confertae is an evergreen coniferous scrub which is characterized by the character species of *Juniperus conferta* (Table 3). Vegetation of this association has a mono-layered structure with its height about 0.2~0.5m in general. The Roso-Juniperetum confertae is dominated by *Juniperus conferta*, and is mixed with *Rosa rugosa*, *Celastrus orbiculatus* var. *strigillosus*, *Rubus parvifolius*, *Elymus mollis*, *Lathyrus japonicus*, *Galium verum* var. *asiaticum*, *Festuca rubra*, *Poa pratensis*, *Moehringia lateriflora* and *Linaria japonica*. The association appears naturally at the rear part of coastal sand dunes, and develops between the *Glehnieta littoralis* of front coastal sand dune communities and *Pinus thunbergii* and *Quercus dentata* forest of inland windbreak. This association is distributed in the cool-temperate region of northern Honshu (Tohoku) and Hokkaido in Japan (Fig. 1).

Elaeagno-Rosetum rugosae Ohba, Miyawaki et Tx. 1973

The Elaeagno-Rosetum rugosae is a summer-green scrub which is characterized by the differential species of *Elaeagnus umbellata*, *Carex breviculmis* var. *fibrillosa*, *Ischaemum antheboroides*, *Viola senaminensis*, *Vitis ficifolia* var. *lobata*, *Zoysia japonica* and *Moehringia lateriflora* (Table 3). Vegetation of this association has a mono-layered structure with its height about 0.4~1m in general. The Elaeagno-Rosetum rugosae is dominated by *Rosa rugosa*, and is mixed with *Elaeagnus umbellata*, *Salix integra*, *Celastrus orbiculatus*, *Pinus thunbergii*, *Calystegia soldanella*, *Miscanthus sinensis*, *Lathyrus japonicus* and *Oenothera erythrosepala*. The association appears naturally at the rear part of coastal sand dunes, and develops between the *Glehnieta littoralis* of front coastal sand dune communities and *Pinus thunbergii* forest of inland windbreak. This association is distributed in the cool-temperate region of northern and middle Honshu (Tohoku, Chubu) in Japan (Fig. 1).

Roso-Maletum mandshuricae Ohba, Miyawaki et Tx. 1973

The Roso-Maletum mandshuricae is a summer-green shrub which is characterized by the character species of *Malus baccata* var. *mandshurica* (Table 3). Vegetation of this association has a two-layered structure with its height about 0.2~4 m in general. The stands are dominated by *Malus baccata* var. *mandshurica*, *Berberis*

amurensis, *Lonicera morrowii*, *Salix integra*, *Schisandra chinensis*, *Euonymus sieboldianus*, *Hydrangea paniculata* and *Weigela hortensis* in the shrub layer and by *Rosa rugosa*, *Artemisia montana*, *Miscanthus sinensis*, *Rubus parvifolius* and *Sanguisorba tenuifolia* var. *alba* in the herb layer. The association appears naturally at the rear part of coastal sand dunes and rocky area, and mostly develops between the Viti-Rosetum rugosae of front coastal mantle community and the Saso-Quercetum dentatae of inland windbreak. This association is distributed in the cool-temperate region of northern Honshu (Tohoku) and Hokkaido in Japan.

Potentillo-Rosetum rugosae Ohba, Miyawaki et Tx. 1973

The Potentillo-Rosetum rugosae is a summer-green scrub which is characterized by the differential species of *Potentilla fragarioides*, *Adenophora triphylla* var. *japonica*, *Geranium yezoensis* var. *pseudopalustre*, *Festuca rubra* and *Ligusticum hultenii* (Table 3). Vegetation of this association has a mono-layered structure with its height about 0.3~0.7m in general. The Potentillo-Rosetum rugosae is dominated by *Rosa rugosa* and *Potentilla fragarioides*, and is mixed with *Rubus parvifolius*, *Adenophora triphylla* var. *japonica*, *Elymus mollis*, *Festuca rubra*, *Celastrus orbiculatus* var. *strigillosus* and *Ligusticum hultenii*. The association appears naturally at the rear part of coastal sand dunes, and develops between the Glehnietea littoralis of front coastal sand dune communities and *Pinus thunbergii* and *Quercus dentata* forest of inland windbreak. The distribution of this association is restricted to Hokkaido in Japan.

Ischaemo-Viticion rotundifoliae Ohba, Miyawaki et Tx. 1973

The Ischaemo-Viticion rotundifoliae in the Viticetea rotundifoliae is a summergreen scrub which is characterized by *Vitex rotundifolia*, *Ischaemum antheophoroides* and *Lathyrus japonicus*. This alliance also develops between coastal sand dunes and coastal windbreak forest, and is widely distributed in the southern part of South Korea and Japan (Fig. 2). The alliance Ischaemo-Viticion rotundifoliae is somewhat similar to the syntaxa and species composition between the two countries (Table 2, 3). The Ischaemo-Viticion rotundifoliae in South Korea subordinates 3 communities of *Vitex rotundifolia* community, the Linario-Viticetum rotundifoliae and the Imperato-Viticetum rotundifoliae, and that in Japan subordinates 6 communities of the Linario-Viticetum rotundifoliae, the Imperato-

Viticetum rotundifoliae, the Vitici-Juniperetum confertae, the Vitici-Juniperetum procumbentis, *Lathyrus japonicus-Rosa wichuraiana* community and *Vitex rotundifolia-Elaeagnus umbellata* community (Table 1).

***Vitex rotundifolia* community**

Vitex rotundifolia community is a summer-green scrub which is characterized by the differential species of *Vitex rotundifolia* and *Ischaemum antheophoroides* (Table 2). Vegetation of this community has a mono-layered structure with its height about 0.3~0.6m in general. This community does not share any diagnostic species without character species of higher units, and thus the stands are totally dominated by *Vitex rotundifolia* and *Ischaemum antheophoroides*. This community also develops at somewhat unstable sand dunes and banks beside beaches, and is mostly located between the Caricetum kobomugi of front coastal sand dune community and *Pinus thunbergii* forest of inland windbreak. This community is widely distributed to the southern part of the cool-temperate region between 35.5~37.5°N in latitude of South Korea (Fig. 2).

Linario-Viticetum rotundifoliae Ohba, Miyawaki et Tx. 1973

The Linario-Viticetum rotundifoliae is a summer-green scrub which is characterized by the differential species of *Linaria japonica* and *Artemisia capillaris* (Table 2, 3). Vegetation of this association has a mono-layered structure with its height about 0.2~0.8m in general. The Linario-Viticetum rotundifoliae is totally dominated by *Vitex rotundifolia*, and is mixed with *Linaria japonica*, *Calystegia soldanella*, *Artemisia capillaris*, *Ischaemum antheophoroides* and *Carex kobomugi*. The association appears naturally at the rear part of coastal sand dunes, and develops between the Glehnietea littoralis of front coastal sand dune communities and *Pinus thunbergii* forest of inland windbreak. The distribution of this association is the warm-temperate region of southern part (35~36.5°N) in South Korea and Honshu in Japan (Fig. 2).

Imperato-Viticetum rotundifoliae Ohba, Miyawaki et Tx. 1973

The Imperato-Viticetum rotundifoliae is a summergreen scrub which is characterized by the differential species of *Imperata cylindrica* var. *koenigii* and *Zoysia macrostachya* (Table 2, 3). Vegetation of this association has a mono-layered structure with its height about 0.1~1m in general. The Imperato-Viticetum rotundifoliae

is totally dominated by *Vitex rotundifolia*, and is mixed with *Calystegia soldanella*, *Lathyrus japonicus*, *Carex pumila*, *Zoysia macrostachya* and *Wedelia prostrata*. The association appears naturally at the rear part of coastal sand dunes, and develops between the *Glehnieta littoralis* of front coastal sand dune communities and *Pinus thunbergii* forest of inland windbreak. This association is distributed widespread to Jeju island in South Korea and the warm-temperate region of Honshu, Kyushu and Shikoku in Japan (Fig. 2).

Vitici-Juniperetum confertae Ohba, Miyawaki et Tx. 1973

The Vitici-Juniperetum confertae is an evergreen coniferous scrub which is characterized by the character species of *Juniperus conferta* and differential species of *Indigofera pseudotinctoria* (Table 3). Vegetation of this association has a mono-layered structure with its height about 0.2~0.4m in general. The Vitici-Juniperetum confertae is dominated by *Juniperus conferta*, and is mixed with *Calystegia soldanella*, *Lathyrus japonicus*, *Imperata cylindrica* var. *koenigii*, *Vitex rotundifolia* and *Linaria japonica*. The association appears naturally at the rear part of coastal sand dunes, and develops between the *Glehnieta littoralis* of front coastal sand dune communities and *Pinus thunbergii* forest of inland windbreak. The distribution range of this association is warm-temperate region of Honshu and Kyushu in Japan (Fig. 2).

Vitici-Juniperetum procumbentis Itow et Kawasato 1980

The Vitici-Juniperetum procumbentis is an evergreen coniferous scrub which is characterized by the character species of *Juniperus chinensis* var. *procumbens* and differential species of *Celastrus orbiculatus* var. *punctatus* (Table 3). Vegetation of this association has a mono-layered structure with its height about 0.2~0.5m in general. The Vitici-Juniperetum procumbentis is dominated by *Juniperus chinensis* var. *procumbens*, and is mixed with *Vitex rotundifolia*, *Paederia scandens*, *Heteropappus hispidus* ssp. *arenarius*, *Crepidiastrum lanceolatum* and *Rosa wichuraiana*. The association appears naturally at the rear part of coastal sand dunes, and develops between the *Glehnieta littoralis* of front coastal sand dune communities and *Pinus thunbergii* forest of inland windbreak. The distribution of this association is restricted to Kyushu in Japan (Fig. 2).

***Lathyrus japonicus*-*Rosa wichuraiana* community**
Lathyrus japonicus-*Rosa wichuraiana* com-

munity is a summergreen scrub which is characterized by the differential species of *Rosa wichuraiana* (Table 3). Vegetation of this community has a mono-layered structure with its height about 0.2~0.6m in general. *Lathyrus japonicus*-*Rosa wichuraiana* community is totally dominated by *Rosa wichuraiana*, and is mixed with *Paederia scandens*, *Lathyrus japonicus*, *Asparagus cochinchinensis*, *Lonicera japonica*, *Calystegia soldanella* and *Cocculus trilobus*. The community appears naturally at nitrophilous coastal sand dunes because of the garbage deposits, and usually develops between the *Glehnieta littoralis* and the *Imperato-Viticetum rotundifoliae* of front coastal sand dune communities and *Pinus thunbergii* forest of inland windbreak. The distribution range of this community is the warm-temperate region of Honshu, Kyushu and Shikoku in Japan.

***Vitex rotundifolia*-*Elaeagnus umbellata* community**

Vitex rotundifolia-*Elaeagnus umbellata* community is a summergreen scrub which is characterized by the differential species of *Elaeagnus umbellata* (Table 3). Vegetation of this community has a mono-layered structure with its height about 0.2~1m in general. *Vitex rotundifolia*-*Elaeagnus umbellata* community is totally dominated by *Elaeagnus umbellata*, and is mixed with *Ischaemum antheophoroides*, *Calystegia soldanella* and *Artemisia capillaris*. The community appears naturally at the rear part of coastal sand dunes, and usually develops between the *Linario-Viticetum rotundifoliae* of front coastal mantle community and *Pinus thunbergii* forest of inland windbreak. The distribution range of this community is the warm-temperate region of Honshu in Japan.

Roso-Viticion rotundifoliae Nakanishi 1979

The Roso-Viticion rotundifoliae in the Viticetea rotundifoliae is also a summergreen scrub which is characterized by *Vitex rotundifolia*, *Rosa wichuraiana*, *Ampelopsis brevipedunculata*, *Lonicera japonica* and *Paederia scandens*. This alliance develops at somewhat stable coastal sand dunes and shingle coasts, and is distributed to the southern part of South Korea and Japan (Fig. 2). The alliance Roso-Viticion rotundifoliae is almost same to the syntaxa and species composition between the two countries (Table 2, 3). The Roso-Viticion rotundifoliae in South Korea and Japan subordinates 1 association of the Roso-Viticetum rotundifoliae (Table 1).

Roso-Viticetum rotundifoliae Nakanishi 1979

The Roso-Viticetum rotundifoliae is a summer-

green scrub which is characterized by the differential species of *Rosa wichuraiana*, *Lonicera japonica* and *Paederia scandens* (Table 2, 3). Vegetation of this association has a mono-layered structure with its height about 0.4~0.7m in general. The Roso-Viticetum rotundifoliae is totally dominated by *Vitex rotundifolia* and *Rosa wichuraiana*, and is mixed with *Ischaemum antheophoroides*, *Lonicera japonica*, *Calystegia soldanella*, *Paederia scandens* and *Chenopodium album* var. *centrorubrum*. This association develops naturally at somewhat stable sand dunes and shingle coasts. The distribution of this association is restricted to the warm-temperate region under 35°N in latitude of the southern coastline in South Korea and Kyushu, Shikoku and southern Honshu in Japan (Fig. 2).

Thuareio-Viticion rotundifoliae Miyawaki et K. Suzuki 1976

The Thuareio-Viticion rotundifoliae in the Viticetea rotundifoliae is a summergreen scrub and herb which are characterized by *Vitex rotundifolia* and *Thuarea involuta*. The alliance Thuareio-Viticion rotundifoliae also develops between coastal sand dunes and coastal wind-break forest, and distributed very restrictedly to the southern part of Japan (Fig. 2). And this alliance subordinates 2 associations of the Thuareio-Viticetum rotundifoliae and the Wedelietum biflorae (Table 1).

Thuareio-Viticetum rotundifoliae Miyawaki et K. Suzuki 1976

The Thuareio-Viticetum rotundifoliae is a summergreen scrub of which differential species are *Thuarea involuta* and *Ipomoea pescaprae* (Table 3). Vegetation of Thuareio-Viticetum rotundifoliae has a mono-layered structure with its height about 0.1~0.8m in general. The association Thuareio-Viticetum rotundifoliae is totally dominated by *Vitex rotundifolia*, and is mixed with *Ipomoea pescaprae*, *Canavalia lineata*, *Thuarea involuta* and *Scaevola sericea*. The Thuareio-Viticetum rotundifoliae appears naturally at the rear part of coastal sand dunes, and develops between the Vigno-Ipomoeetum pediscaprae of front coastal sand dune community and Wedelietum biflorae of coastal mantle community. And the distribution of the Thuareio-Viticetum rotundifoliae is very restricted to the Nansei islands and the Ogasawara islands in Japan (Fig. 2).

Wedelietum biflorae Miyawaki et K. Suzuki 1976

The Wedelietum biflorae is a summergreen perennial herb of which character species is

Wedelia biflora (Table 3). Vegetation has a mono-layered structure with its height 0.4~1m in general. This association is totally dominated by *Wedelia biflora*, and is mixed with *Ipomoea pescaprae*, *Thuarea involuta*, *Crinum asiaticum* var. *japonicum* and *Scaevola sericea*. The Wedelietum biflorae appears naturally at the rear part of coastal sand dunes and at the forest edge of coastal windbreak forest. This association mostly develops between the Vigno-Ipomoeetum pediscaprae of front coastal sand dune community and the Messerschmidio-Scaevoletum taccadae of evergreen coastal forest. And the Wedelietum biflorae is distributed in southern Kyushu and the Nansei islands in Japan.

As a result, coastal mantle vegetation in South Korea and Japan consists of 2 vegetation types: the Rosetalia rugosae Ohba, Miyawaki et Tx. 1973 and the Viticetea rotundifoliae Ohba, Miyawaki et Tx. 1973. The Rosetalia rugosae is a northern type coastal mantle vegetation, and is distributed to the cool-temperate region above 36°N in South Korea and Japan. The order is characterized by *Rosa rugosa* and subordinates the Rosion rugosae Ohba, Miyawaki et Tx. 1973 in all. The Rosion rugosae in South Korea consists of *Rosa rugosa* community, but that in Japan includes 5 associations. On the other hand, the Viticetea rotundifoliae is a southern type coastal mantle vegetation, and is widely distributed to the warm-temperate region below 37°N in South Korea and Japan. The class is characterized by *Vitex rotundifolia*. The Viticetea rotundifoliae in South Korea subordinates 2 alliances, 3 associations and 1 community, but that in Japan consists of 3 alliances, 7 associations and 2 communities. This higher diversification of coastal mantle communities in Japan is due to a wider range of climatic conditions from subtropic to subarctic in the Japanese Archipelago. Consequently, the coastal mantle communities in Japan are much more diversified, and also show more diverse species composition and distributional pattern than that in South Korea. On the other hand, the coastal mantle communities in South Korea are exposed to strong human disturbances than those in Japan which are maintained relatively sound species composition in structural aspect. Consequently, coastal mantle communities in South Korea are consisted of high frequency species and/or specific dominant species. Thus, it is characteristic that coastal mantle communities in South Korea maintain more simple physiognomy and much more simple species composition and community structure than those in Japan.

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