

Vegetation of the UOEH Campus and Its Surrounding Area with Reference to Conservation of Campus Environment

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Abstract: The Kitakyushu City area, in which the University of Occupational and Environmental Health, Japan (UOEH) campus lies, is situated in the region of the evergreen broad-leaf, or laurel-leaf, forests. Our studies on relict forest stands revealed that the original forest communities in the area were *Cyrtomio-Litsetum japonicae* and *Euonymo-Pittosporum tobirae* in the coastal area, *Arisemato ringentis-Machiletum thunbergii* in the bottomland, *Symploco-Castanopsietum sieboldii* and *Ardasio-Castanopsietum sieboldii* in foothill area, and *Distylio-Cyclobalanopsietum stenophyllae*, *Actinodaphnetum lancifoliae* and *Skimmio-Cyclobalanopsietum acutae* on the mountain slopes. The secondary forests in the area are *Castanopsis-Cyclobalanopsis* coppice of sprout origin, red-pine forest and deciduous forests of various dominants. The original forest on the UOEH campus is assumed to be *Symploco-Castanopsietum sieboldii*, an evergreen broad-leaf forest, some 25 m high and 1 m dbh in canopy trees. The secondary forest on the campus is dominated by *Quercus serrata*, accompanied by *Rhus succedanea*, *Platycarya strobilacea* and *Castanopsis cuspidata* var. *sieboldii*. A small wetland near the north gate is dominated by *Typha angustata*. Slopes on the campus, which were created by cutting-off or filling-up of the ground, are invaded by *Miscanthus sinensis*, *Solidago altissima* (alien) and many other herbaceous plants. One hundred and thirty-six species of flowering plants and eight species of ferns were recorded from the campus. Conservation problems are discussed from the standpoint of vegetation science.

Keywords: original forests, secondary forests, flora, conservation, Kitakyushu.

(Received 10 July 1981)

Introduction

Since the turn of the century, Kitakyushu City has developed as one of the most modernized iron-refinery areas of Japan. Gradual shrinkage of natural vegetation, as well as the increase of human populations, was inevitably accompanied by the industrializing and urbanizing processes during those years. The campus of the University of Occupational and Environmental Health, Japan (hereafter abbreviated as UOEH) is located at a

This study was supported by Grant-in-Aid No. 503071 in 1980 for Special Research Project on Environmental Science, Ministry of Education, Culture and Science, Japan. We thank Mmes. K. Nakaniishi and S. Igawa for their help in drawing figures and typewriting the manuscript.

corner of the area of such historical background. Our decision to study the vegetation of the campus and its neighboring areas was formed not only to record the present status of the vegetation itself but also to understand its original conditions, to comprehend the environment of an industrial area with or without the green mantle, and to design a high-quality environment with the vegetation restoration in the highly urbanized and industrialized areas of Kitakyushu City for the future.

The present paper, as a first step in our studies, describes the original and actual vegetation of the northwestern part of Kitakyushu City, in which UOEH campus is located. Field studies were carried out in February and May, 1980. Data that had been collected in the past from the region under consideration were used in the present study, together with those gathered at this time.

Environment and Vegetation of Kitakyushu City

The study area occupies the northwestern corner of Kitakyushu City and the adjacent area east of the Onga River. The area is some 300 km². The topography is mostly hilly, rolling in low elevations of 50 to 300 m above sea level. Three peaks of mountains rise along the southern border of the study area. They are Mts. Sarakura-yama (622 m in altitude), Gongen-yama (617 m) and Hobashira-yama (480 m). The UOEH campus occupies a corner of the hilly region.

Climatic records made at Iizuka Weather Station, which lies 20 km south of the study area, are 14.6°C in the annual mean air temperature, 26.0°C as the mean air temperature of the warmest month (August), 4.1°C in the coldest month (January) and 1788 mm as the annual precipitation. The climatic conditions of the study area seem to be nearly the same as those of Iizuka. The mid- and low-elevation areas of the Kitakyushu region, lower than 900 m in altitude, belong to the evergreen broad-leaf forest region, and therefore the whole study area is also located in this category.

Geologically, the study area is made up of the Tertiary Ashiya-, Ootsuji- and Nōgata-Groups and the Cretaceous Kanmon Group. The former formations occupy the central portion of the study area toward Myokenzaki in the north, Kurosaki in the east and Shinmatsubara-kaigan in the west. In this Tertiary region coal mines were distributed over a wide area. They are now abandoned but huge heaps of coal waste still exist in some places. The Kanmon Group occupies the rest of the area to the east and west. The UOEH campus is situated in the Tertiary area.

The natural vegetation of the study area has nearly completely disappeared due to human activities in the past, especially due to the urbanization process since the turn of the century. Only some precincts of shinto-shrines and buddist temples, as well as a few tracts of less disturbed coastal areas and mountain tops, still support natural plant communities. Our field studies in those relict stands revealed the original distributions of the natural communities, as given below.

Besides the herbaceous vegetation on dunes and beaches, the original vegetation in

coastal areas was a low- to medium-sized scrub, stunted by strong winds from the sea. It consisted of two plant-associations, *Cyrtomio-Litsetum japonicae* and *Euonymo-Pittosporum tobirae*. Both are an evergreen broad-leaf, or laurel-leaf scrub, 3 to 5 m high. The relict stands are still found along the coast of the study area. On the bottomland neighboring the coastal areas, there was a natural community called *Arisaemato ringentis-Machiletum thunbergii*. This is also an evergreen broad-leaf forest, 25 to 30 m high and 1 m dbh in canopy trees. The floor vegetation is made up of a dense growth of evergreen ferns. The other shrubby and herbaceous components are also evergreen. This natural community was distributed only on the most fertile habitat of lowlands and it has completely disappeared from the study area. On the hills, two plant-associations, *Symploco glaucae-Castanopsietum sieboldii* and *Ardisio-Castanopsietum sieboldii*, were originally distributed. Their physiognomy and structure are nearly the same as in the

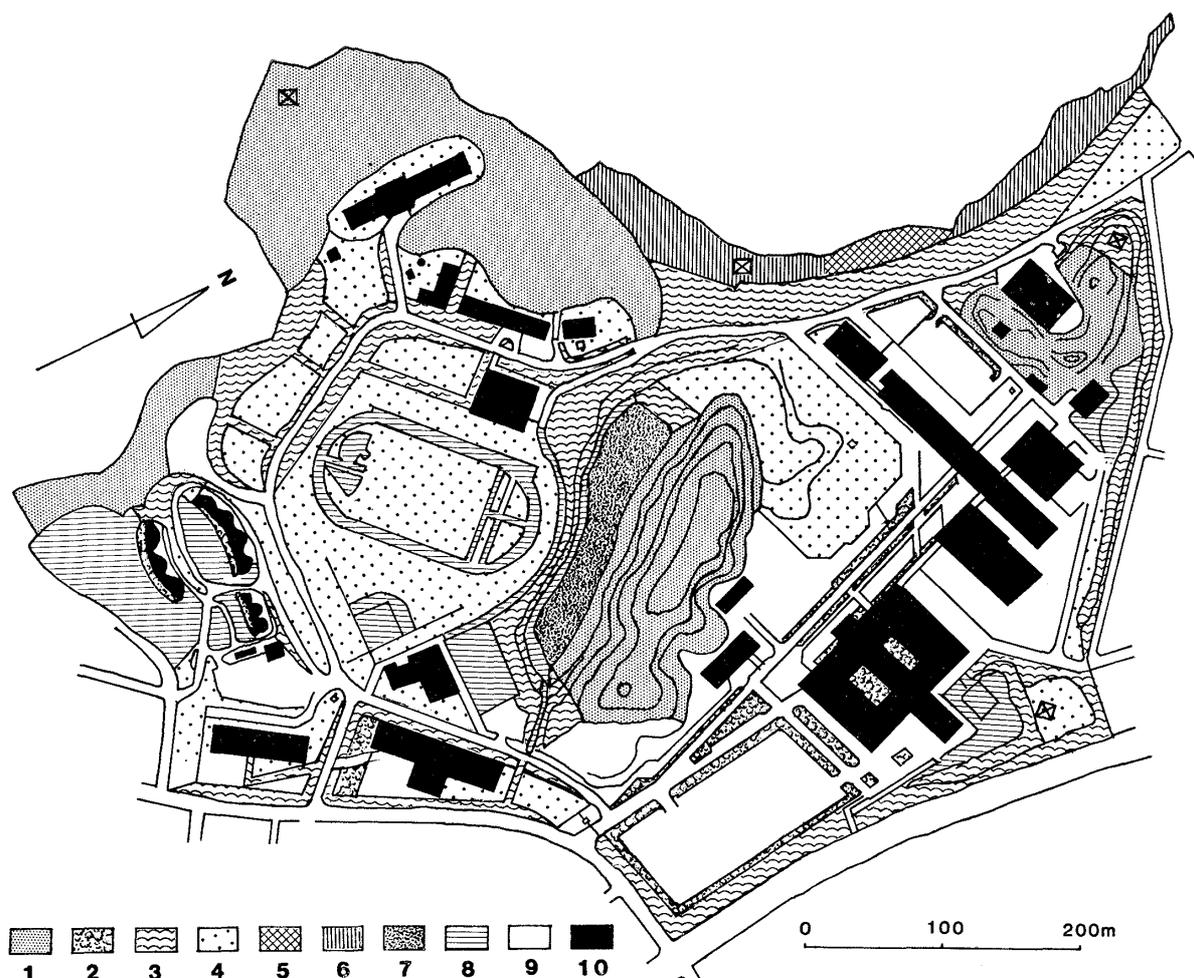


Fig. 1. Physiognomic map of UOEH campus.

1. Forested area, 2. Planted trees and shrubs, 3. Lawn on slope, 4. Lawn on flat site, 5. Wetland, 6. Abandoned field, 7. Reservoir, 8. Bare ground, 9. Pavement, 10. Building.

preceding association. On the mountain slopes, there were originally *Distylio-Cyclobalanopsietum stenophyllae*, *Actynodaphnetum lancifoliae* and *Skimmio-Cyclobalanopsietum acutae*. All of them are also evergreen broad-leaf forests.

Interference by man on the natural environment has converted those natural forest communities into the secondary ones that are present today. The secondary forest communities found in the study area are *Castanopsis-Cyclobalanopsis* coppice of sprout origin and deciduous forests dominated by various trees. Their distributions and species compositions depend on the geology as well as on the intensity of human impact in the past. The *Castanopsis-Cyclobalanopsis* coppice that replaces the *Castanopsis*-dominated natural forests (*Symploco-* and *Ardisio-Castanopsietum*), is distributed in the area of the Tertiary formations, while the *Zanthoxylum ailanthoides*-dominated deciduous forest is abundant in the area of the Kanmon Group. Distribution of *Pasania edulis*-dominated coppice is also restricted in the later geological area, but is not so abundant. *Platycarya strobilacea*, a non-dominant deciduous tree found only in the secondary forests is found exclusively in those on the Tertiary formations. Trees that are geologically independent in their distribution are *Castanopsis cuspidata* (including var. *sieboldii*), *Cinnamomum camphora* and *Quercus serrata*.

Vegetation of the UOEH Campus

The UOEH campus is located on a hill of the Tertiary formations. It was created by cutting-off of the hill tops and filling-up of the depressions. The slopes that were neither cut off nor filled up still support the vegetation that has been seen before denudation and reclamation were performed in the 1970's. Habitat types on the campus can be categorized into the forested area, the wetland and the denuded and reclaimed bare area as shown in Fig. 1. The outline of these areas is as follows.*

A. Forested area

Forested areas are located on (1) the hill between the Administration Building of the university and Ryugaike Pond (Hereafter the hill is called Momijigaoka Hill in the present paper), (2) the slope north of the nurses' dormitory and female students' dormitory, (3) the hill west of the faculty members accommodations and (4) the area around the water-supply facility. Those areas support secondary forests. The vegetation of the sites (1) and (2) are as follows.

* Vegetational records in the present paper are given according to the following scales. Dominance class 5: with cover of more than 3/4 of sample plot, 4: with 1/2-3/4 cover, 3: 1/4-1/2 cover, 2: 1/20-1/4 cover, 1: 1/100-1/20 cover, +: with cover up to 1/100 or solitary with small cover. Sociability class 5: growing in large, almost pure population stands, 4: forming in a large carpet, 3: forming medium patches or cushions, 2: forming clumps or small patches, 1: growing solitary. In the case that, for example, the dominance class is 4 and the sociability class is 3, it is expressed as "4.3", although the case of "+.1" is recorded only as "+". (cf. Müller-Dombois & Ellenberg, 1974)

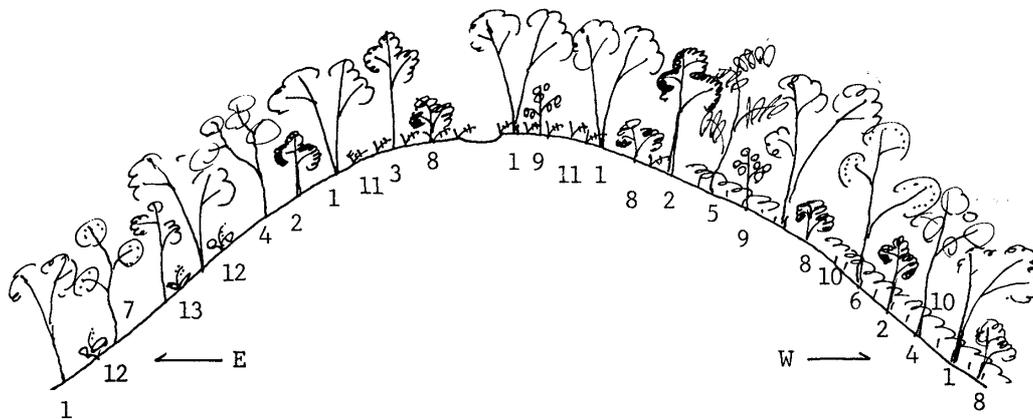


Fig. 2. Vegetation profile of Momijigaoka Hill.

1. *Quercus serrata*, 2. *Symplocos lucida*, 3. *Dendropanax trifidus*,
4. *Rhus succedanea*, 5. *Zanthoxylum ailanthoides*, 6. *Cinnamomum camphra*,
7. *Mallotus japonicus*, 8. *Rhododendron kaempferi*, 9. *Ligustrum japonicum*,
10. *Hipriopteris glauca*, 11. *Dicranopteris linearis*,
12. *Farfugium japonicum*, 13. *Ardisia japonica*.

(1) Momijigaoka Hill

Momijigaoka Hill is about 250 m long and 100 m wide and 20 m in height from the base, lying in a NW–SE direction. At the west base of the hill, there is an artificial reservoir called Ryugaike, which is 200 m long and 25 m wide. The forest vegetation of the hill is much denser on the east slope than on the west slope. This is due to the difference of soil moisture between the two slopes (Fig. 2). On the east slope, foliage of the tree layer is so dense that the floor vegetation is sparse due to the poor light condition. On the west slope, on the other hand, trees and shrubs are sparse and, therefore, the floor vegetation is dense, being made up of *Dicranopteris linearis* and *Hipriopteris glauca*. The physiognomy is seen in Fig. 4. Vegetational records from both slopes are given below.

East slope Slope direction: N 55 E, slope degree: 22°, Sample size: 10 m × 10 m.

[Treelayer. Height: 5–8 m, coverage: 100%, dbh: 16 cm]

Quercus serrata 3.3, *Rhus succedanea* 3.3, *Dendropanax trifidus* 1.1, (+ in following spp.) *Ligustrum japonicum*. *Vaccinium bracteatum*, *Mallotus japonicus*, *Pinus densiflora*, *Symplocos lucida*, *Smilax china*, *Akebia trifoliata*, *Lonicera hypoglauca*, *Paederia scandens* var. *mairei*.

[Shrub layer. Height: 2 m, coverage: 50%]

Rhododendron kaempferi 2.2, *Vaccinium bracteatum* 2.3, *Ligustrum japonicum* 1.2, (+ in following spp.) *Quercus serrata*, *Rhus succedanea*, *Cinnamomum japonicum*, *Akebia trifoliata*.

[Herb layer. Height: 0.5 m, coverage: 1%]

(+.2 in following spp.) *Quercus serrata*, *Ligustrum japonicum*, *Neolitsea sericea*, *Cymbidium goeringii*, *Platanthera minor*, *Dryopteris erythrosora*, (+ in following spp.) *Arundinaria pygmaea* var. *glabra*, *Smilax china*, *Akebia trifoliata*, *Vaccinium bracteatum*, *Mallotus japonicus*, *Cocculus trilobus*, *Celastrus orbiculatus*, *Lyonia ovalifolia* var. *elliptica*, *Elaeagnus pungens*, *Rubus hirsutus*, *Viburnum erosum*, *Viola grypoceras*, *Pteridium aquilinum*, *Osmunda japonica*, *Farfugium japonicum*, *Oplismenus undulatifolius* var. *japonicus*, *Dicranopteris linearis*, *Hipriopteris glauca*.

West slope Slope direction: S 45 W, slope degree: 25°, Sample size: 10 m×10 m.

[Tree layer. Height: 6 m, coverage: 60%]

Quercus serrata 3.2, *Rhus succedanea* 2.2, *Symplocos lucida* 2.1, *Lyonia ovalifolia* var. *elliptica* 1.2, *Cinnamomum camphora* 1.2, *Zanthoxylum ailanthoides* 1.1, *Myrica rubra* 1.1, (+ in following spp.) *Mallotus japonicus*, *Aralia elata*, *Celastrus orbiculatus*, *Paederia scandens* var. *mairei*.

[Shrub layer. Height: 2 m, coverage: 5%]

Eurya japonica 1.2, *Lyonia ovalifolia* var. *elliptica* +, *Rhododendron kaempferi* +, *Rhus japonica* +, *Neolitsea sericea* +.

[Herb layer. Height: 0.8 m, coverage: 95%]

Hipriopteris glauca 4.4, *Dicranopteris linearis* 3.3, (+ in following spp.) *Pteridium aquilinum*, *Machilus thunbergii*, *Neolitsea sericea*, *Vaccinium bracteatum*, *Quercus serrata*, *Lyonia ovalifolia* var. *elliptica*, *Prunus jamasakura*, *Akebia trifoliata*, *Paederia scandens* var. *mairei*.

(2) Forest stand north of the nurses' dormitory

Slope direction: N 60 E, slope degree: 35°, sample plot size: 10 m×10 m.

[Tree layer. Height: 8 m, coverage: 100%]

Rhus succedanea 4.4, *Quercus serrata* 1.1, *Zanthoxylum ailanthoides* 1.1, *Platycarya strobilacea* 1.1, *Mallotus japonicus* +, *Smilax china* +, *Stauntonia hexaphylla* +, *Akebia trifoliata* +, *Celastrus orbiculatus* +, *Lonicera hypoglauca* +, *Paederia scandens* var. *mairei* +.

[Shrub layer. Height: 2–4 m, coverage: 90%]

Eurya japonica 4.5, *Quercus serrata* 1.2, *Smilax china* +.2, (+ in following spp.) *Callicarpa mollis*, *Wistaria brachybotrys*, *Castanea crenata*, *Ficus erecta*, *Euonymus alatus*, *Lonicera gracilipes*, *Ligustrum japonicum*, *Neolitsea sericea*.

[Herb layer. Height: 1 m, coverage: 60%]

Rubus buergeri +.2, (+ in following spp.) *Wistaria brachybotrys*, *Celastrus orbiculatus*, *Kadsura japonica*, *Dendropanax trifidus*, *Rhododendron kaempferi*, *Ficus erecta*,

Rubus hirsutus, *Euscaphis japonica*, *Lyonia ovalifolia* var. *elliptica*, *Zanthoxylum schinifolium*, *Fatsia japonica*, *Dryopteris erythrosora*, *Microlepia marginata*, *Cymbidium goeringii*, *Aster scaber*, *Oplismenus undulatifolius* var. *japonicus*, *Pyrola japonica*, *Ixeris dentata*, *Farfugium japonicum*, *Miscanthus sinensis*.

(3) Valley bottom north of female students' dormitory

Sample-plot size: 10 m×20 m.

[Tree layer. Height: 10 m, coverage: 90%]

Prunus jamasakura 3.3, *Platycarya strobilacea* 2.2, *Rhus succedanea* 2.1, *Kalopanax pictus* 1.1, *Neolitsea sericea* 1.1, (+ in following spp.) *Phyllostachys heterocycla*, *Dendropanax trifidus*, *Akebia trifoliata*, *Ampelopsis brevipedunculata*.

[Subtree layer. Height: 5 m, coverage: 70%]

Eurya japonica 4.4, *Ficus erecta* 1.2, *Ligustrum japonicum* +. 2, (+ in following spp.) *Symplocos lucida*, *Machilus thunbergii*, *Quercus serrata*.

[Shrub layer. Height: 1.5 m, coverage: 10%]

Neolitsea sericea 1.2, *Eurya japonica* 1.2, (+ in following spp.) *Fatsia japonica*, *Cinnamomum camphora*, *Ilex chinensis*, *Cinnamomum japonicum*, *Euonymus alatus*, *Ehretia ovalifolia*, *Ficus erecta*, *Viburnum erosum*, *Lonicera hypoglauca*, *Rhus succedanea*, *Phyllostachys heterocycla*, *Stauntonia hexaphylla*.

[Herb layer. Height: 0.5 m, coverage: 60%]

Dryopteris erythrosora 2.2, (+.2 in following spp.) *Hipriopteris glauca*, *Farfugium japonicum*, *Rubus buergerii*, *Carex lenta*, *Oplismenus undulatifolius* var. *japonicus*, *Viola ovato-oblonga*, (+ in following spp.) *Microlepia marginata*, *Lysimachia clethroides*, *Parthenocissus tricuspidata*, *Dendropanax trifidus*, *Stauntonia hexaphylla*, *Smilax china*, *Rubus hirsutus*, *Aster ageratoides* var. *semiamplexicaulis*, *Ardisia japonica*, *Ampelopsis brevipedunculata*, *Celastrus orbiculatus*, *Lapsana humilis*, *Lilium cordatum*, *Salvia japonica*, *Torilis japonica*, *Lonicera gracilipes*, *Osmunda japonica*, *Clematis terniflora*, *Sanicula chinensis*, *Semiaquilegia adoxoides*.

B. Wetland at westernmost corner of the campus

The UOEH campus is fringed with a water course along the western border, to which a filled-up slope is facing. Along the water course, there is a small, crescent-shaped wetland, ca. 100 m long and 15 m wide (Fig. 3 and Fig. 5). The vegetation record taken from the wetland is as follows.

[Vegetation height: 0.8 m, coverage: 80%]

Typha angustata 3.2, *Juncus effusus* var. *decipiens* 3.4, (+ in following spp.) *Polygonum thunbergii*, *Ranunculus quelpaertensis*, *Aneilema keisak*, *Alisma canaliculatum*, *Beckmannia syzigachne*, *Juncus* sp., *Phalaris arundinaceae*, *Rumex japonicus*,

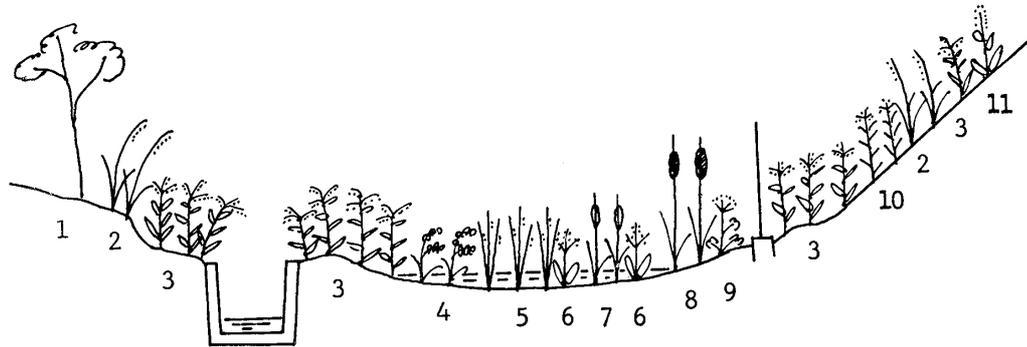


Fig. 3. Vegetation profile of wetland.

1. *Rhus succedanea*, 2. *Miscanthus sinensis*, 3. *Solidago altissima*,
4. *Beckmannia syzigachne*, 5. *Juncus effusus* var. *decipiens*, 6. *Alisma*
plantago-aquatica var. *orientale*, 7. *Typha angustata*, 8. *Typha lati-*
folia, 9. *Oenanthe javanica*, 10. *Erigeron sumatrensis*, 11. *Rumex*
acetosa.

Cardamine flexuosa, *Oenanthe javanica*.

C. Denuded and reclaimed area

The areas that were denuded or reclaimed in the creating process of the present campus are planted artificially (Fig. 6). They also have been invaded by indigenous and alien species, as listed below.

[Alien plants] *Solidago altissima*, *Trifolium repens*, *Erigeron sumatrensis*, *Erigeron annuus*, *Rumex acetosella*, *Gnaphalium purpureum*, *Hypochoeris radicata*, *Phytolacca americana*.

[Indigenous plants] *Solidago virga-surea* var. *asiatica*, *Gnaphalium affine*, *Gnaphalium japonicum*, *Youngia denticulata*, *Artemisia princeps*, *Artemisia japonica*, *Lapsana humilis*, *Picris hieracioides*, *Paederia scandens* var. *mairei*, *Veronica arvensis*, *Lotus corniculatus* var. *japonicus*, *Vicia sepium*, *Rumex acetosa*, *Oxalis corniculata*, *Miscanthus sinensis*, *Cynodo dactylon*, *Spiranthes sinensis*, *Pteridium aquilinum*, *Mallotus japonicus*, *Rhus javanica*, *Rhus succedanea*, *Rubus palmatus*, *Zanthoxylum schinifolium*.

List of Flowering Plants and Ferns

Plants found by us on the UOEH campus in two surveys (February and May, 1980) were enumerated to 136 species of flowering plants and 8 species of ferns and their respective allies. The list given below does not include the ornamental and garden plants that were recently planted. Family names and their order and scientific names of plants are according to Ohwi's Flora of Japan (Ohwi, 1965a, b).

GYMNOSPERMAE 裸子植物**Pinaceae マツ科***Pinus densiflora* Sieb. et Zucc. アカマツ**Taxodiaceae スギ科***Cryptomeria japonica* D. Don スギ**ANGIOSPERMAE 被子植物****MONOCOTYLEDONEAE 単子葉植物****Typhaceae ガマ科***Typha latifolia* Linn. ガマ*T. angustata* Bory et Chauberd ヒメガマ**Alismataceae オモダカ科***Alisma canaliculatum* A. Br. et Boucle ヘラオモダカ*A. plantago-aquatica* var. *orientale* Samuels. サジオモダカ**Gramineae イネ科***Arundinaria pygmaea* var. *glabra* Ohwi ネザサ*Beckmannia syzigachne* Fernald カズノコグサ*Cynodon dactylon* Pers. ギョウギシバ*Imperata cylindrica* var. *koenigii* Dur. et Schinz チガヤ*Miscanthus sinensis* Anderss. ススキ*Oplismenus undulatifolius* var. *japonicus* Koidz. チヂミザサ*Phalaris arundinaceae* Linn. クサヨシ*Phyllostachys bambusoides* Sieb. et Zucc. マダケ*Ph. heterocycla* Matsum. モウソウチク**Cyperaceae スゲ科***Carex lenta* D. Don ナキリスゲ**Commelinaceae ツユクサ科***Aneilema keisak* Hassk. イボクサ**Juncaceae イグサ科***Juncus effusus* var. *decipiens* Buchn. イグサ*Juncus* sp. コウガイゼキショウ**Liliaceae ユリ科***Alectris spicata* Bureau et Franch. ソクシンラン*Lilium cordatum* Koidz. ウバユリ*Ophiopogon ohwii* Okuyama ナガバジャノヒゲ*Smilax china* Linn. サルトリイバラ**Iridaceae アヤメ科***Sisyrinchium atlanticum* Bickn. ニワゼキショウ**Orchidaceae ラン科***Cymbidium goeringii* Reichb. f. シュンラン*Platanthera minor* Reichb. f. オオバノトンボソウ*Spiranthes sinensis* Ames ネジバナ**DICOTYLEDONEAE 双子葉類****CHORIPETALAE 離弁花類****Myricaceae ヤマモモ科***Myrica rubra* Sieb. et Zucc. ヤマモモ**Juglandaceae クルミ科***Platycarya strobilaceae* Sieb. et Zucc. ノグルミ

Fagaceae ブナ科

- Castanea crenata* Sieb. et Zucc. クリ
Castanopsis cuspidata var. *sieboldii* Nakai スダシイ
Cyclobalanopsis glauca Oerst. アラカシ
Quercus serrata Thunb. コナラ

Moraceae クワ科

- Ficus erecta* Thunb. イヌビワ

Polygonaceae タデ科

- Polygonum thunbergii* Sieb. et Zucc. ミゾソバ
Rumex acetosa Linn. スイバ
R. acetosella Linn. ヒメスイバ
R. japonicus Houtt. ギンギン

Phytolaccaceae ヤマゴボウ科

- Phytolacca americana* Linn. ヨウシュヤマゴボウ

Ranunculaceae キンポウゲ科

- Clematis terniflora* DC. センニンソウ
Ranunculus quelpaertensis Nakai キツネノボタン
Semiaquilegia adoxoides Makino ヒメウズ

Lardizabaraceae アケビ科

- Akebia quinata* Decaisn. アケビ
A. trifoliata Koidz. ミツバアケビ
Stauntonia hexaphylla Decaisn. ムベ

Menispermaceae ツツラフジ科

- Cocculus trilobus* DC. アオツツラフジ

Magnoliaceae モクレン科

- Kadsura japonica* Dunal. ビナンカズラ

Lauraceae クスノキ科

- Actinodaphne lancifolia* Meisn. カゴツキ
Cinnamomum camphora Sieb. クスノキ
C. japonicum Sieb. ヤブニクケイ
Machilus thunbergii Sieb. et Zucc. タブノキ
Neolitsea sericea Koidz. シロダモ

Cruciferae アブラナ科

- Cardamine flexuosa* With. タネツケバナ

Rosaceae バラ科

- Amelanchier asiatica* Endl. ザイフリボク
Prunus jamasakura Sieb. ヤマザクラ
Rosa miltiflora Thunb. ノイバラ
Rubus buergeri Miq. フユイチゴ
R. hirsutus Thunb. クサイチゴ
R. palmatus Thunb. ナガバモミジイチゴ

Leguminosae マメ科

- Acasia* sp. アカシア
Astragalus sinicus Linn. ゲンゲ
Dunbaria villosa Makino ヒメクズ
Lespedeza cytotrya Miq. マルバハギ
Lotus corniculatus var. *japonicus* Regel ミヤコグサ
Milletia japonica A. Gray ナツフジ
Pueraria lobata Ohwi クズ

- Trifolium repens* Linn. シロツメクサ
Vicia hirsuta S.F. Gray スズメノエンドウ
V. sepium Linn. カラスノエンドウ
Wistaria brachybotrys Sieb. et Zucc. ヤマフジ

Oxalidaceae カタバミ科

- Oxalis corniculata* Linn. カタバミ

Rutaceae ミカン科

- Zanthoxylum ailanthoides* Sieb. et Zucc. カラスザンショウ
Z. schinifolium Sieb. et Zucc. イヌザンショウ

Euphorbiaceae トウダイグサ科

- Mallotus japonicus* Muell. Arg. アカメガシワ

Anacardiaceae ウルシ科

- Rhus javanica* Linn. スルデ
R. succedanea Linn. ハゼノキ

Aquifoliaceae モチノキ科

- Ilex chinensis* Sims ナナメノキ
I. integra Thunb. モチノキ
I. rotunda Thunb. クロガネモチ

Celastraceae ニシキギ科

- Celastrus orbiculatus* Thunb. ツルウメモドキ
Euonymus alatus Sieb. コマユミ

Staphyleaceae ミツバウツギ科

- Euscaphis japonica* Kanitz ゴンズイ

Vitaceae ブドウ科

- Ampelopsis brevipedunculata* Trautv. ノブドウ
Parthenocissus tricuspidata Planch. ナツヅタ

Sheaceae ツバキ科

- Camellia japonica* Linn. ヤブツバキ
Eurya japonica Thunb. ヒサカキ
Thea sinensis Linn. チャノキ

Violaceae スミレ科

- Viola grypoceras* A. Gray タチツボスミレ
V. ovato-oblonga Makino ナガバタチツボスミレ
V. violacea Makino シハイスミレ

Elaeagnaceae グミ科

- Elaeagnus pungens* Thunb. ナワシログミ

Araliaceae ウコギ科

- Aralia elata* Seemann タラノキ
Dendropanax trifidus Makino カクレミノ
Fatsia japonica Decne. et Planch. ヤツデ
Kalopanax pictus Nakai ハリギリ

Umbeliferae セリ科

- Oenanthe javanica* DC. セリ
Sanicula chinensis Bunge ウマノミツバ
Torilis japonica DC. ヤブジラミ

GAMOPETALAE 合弁花類**Pyrolaceae** イチャクソウ科

- Pyrola japonica* Klenze イチャクソウ

Ericaceae ツツジ科*Lyonia ovalifolis* var. *elliptica* Hand. -Mazz. ネジキ*Rhododendron kaempferi* Planch. ヤマトツツジ*Vaccinium bracteatum* Thunb. シャシャンボ**Myrsinaceae** ヤブコウジ科*Ardisia japonica* Blume ヤブコウジ**Primulaceae** サクラソウ科*Lysimachia clethroides* Duby オカトラノオ**Symplocaceae** ハイノキ科*Symplocos lucida* Sieb. et Zucc. クロキ**Oleaceae** モクセイ科*Ligustrum japonicum* Thunb. ネズミモチ**Gentianaceae** リンドウ科*Gentiana zollingeri* Fawcett. フデリンドウ**Verbenaceae** クマツヅラ科*Callicarpa japonica* Thunb. ムラサキシキブ*C. mollis* Sieb. et Zucc. ヤブムラサキ*Clerodendron trichotomum* Thunb. クサギ**Boraginaceae** ムラサキ科*Ehretia ovalifolia* Hassk. チシャノキ**Labiatae** シソ科*Salvia japonica* Thunb. アキノタムラソウ**Scrophulariaceae** ゴマノハグサ科*Veronica arvensis* Linn. タチイヌノフグリ**Rubiaceae** アカネ科*Paederia scandens* var. *mairei* Hara ヘクソカズラ**Caprifoliaceae** スイカズラ科*Lonicera affinis* Hook. et Arn. ハマニンドウ*L. gracilipes* Miq. ヤマウゲイスカグラ*L. hypoglauca* Miq. キダチニンドウ*Viburnum erosum* Thunb. コバノガマズミ**Compositae** キク科*Artemisia japonica* Thunb. オトコヨモギ*A. princeps* Pampan. ヨモギ*Aster ageratpodes* var. *semiamplexicaulis* Ohwi ヤマシロギク*A. scaber* Thunb. シラヤマギク*Cirsium japonicum* DC. ノアザミ*Erigeron annuus* Pers. ヒメジョオン*E. sumatrensis* Retz. オオアレチノギク*Eupatorium chinense* Linn. var. *simplicifolium* Kitam. ヒヨドリバナ*Farfugium japonicum* Kitam. ツワブキ*Gnaphalium affine* D. Don. ハハコグサ*G. japonicum* Thunb. チチコグサ*G. purpureum* Linn. チチコグサモドキ*Hypochoeris radicata* Linn. ブタナ*Ixeris dentata* Nakai ニガナ*Lapsana humilis* Makino ヤブタビラコ*Picris hieracioides* var. *glabrescens* Ohwi コウゾリナ*Solidago altissima* Linn. セイタカアワダチソウ

- S. virga-aurea* var. *asiatica* Nakai アキノキリンソウ
Sonchus oleraceus Linn. ヘルノノゲシ
Youngia denticulata Kitam. ヤクシソウ

PTERIDOPHYTA 羊歯植物

Gleicheniaceae ウラジロ科

- Dicranopteris linearis* Underw. コシダ
Hipriopteris glauca ST. John ウラジロ

Pteridaceae ワラビ科

- Microlepia marginata* C. Chr. フモトシダ
Pteridium aquilinum Linn. ワラビ
Sphenomeris chinensis Maxon ホラシノブ

Polypodiaceae ウラボシ科

- Pleopeltis thunbergiana* Kaulf. ノキシノブ

Aspidiaceae オシダ科

- Dryopteris erythrosora* O. Kuntze ベニシダ

Osmundaceae ゼンマイ科

- Osmunda japonica* Thunb. ゼンマイ

Conservation of Environmental Conditions on the UOEH Campus

The green mantle is one of the important elements of human environment. Its restoration in denuded or reclaimed areas is critical in securing a high-quality condition of human life. To have a sustainable green mantle, the vegetation to be restored in non-vegetated habitats should not only harmonize with the regional climate and social circumstances but also be fitting to the ecological conditions of the habitat in question. This point of view implies the indigenous plants, rather than introduced exotic ones, as a basic material for the vegetation restoration project in the denuded and reclaimed areas. Our suggestions from the just-mentioned viewpoint regarding the conservation problems are as follows.

1) Relict forest stands found presently on the campus, even though they are secondary in nature, should be preserved as an ecological park for study and education, since they are well adapted to the regional climate and the local habitat. The only exceptions are sites where some scientific and/or educational projects, like nature trails, outdoor exhibits, experiments, are programmed.

2) Of the slopes that are fringing the campus, those near the north gate are high and appropriate for planting native trees. *Cyclobalanopsis gilva*, the symbol tree of Kitakyushu City, *Cinnamomum camphora* and *Cyclobalanopsis glauca*, all evergreen broad-leaf trees, are suggested for this purpose. The slope at the southern border of the campus is also suitable for tree-planting.

3) Rhododendrons and azaleas are appropriate for slopes with relatively low height. They are useful to keep the top soil free from erosion.

4) A trail is fringing the west side of Ryugaiké Pond and a slope rising from the trail

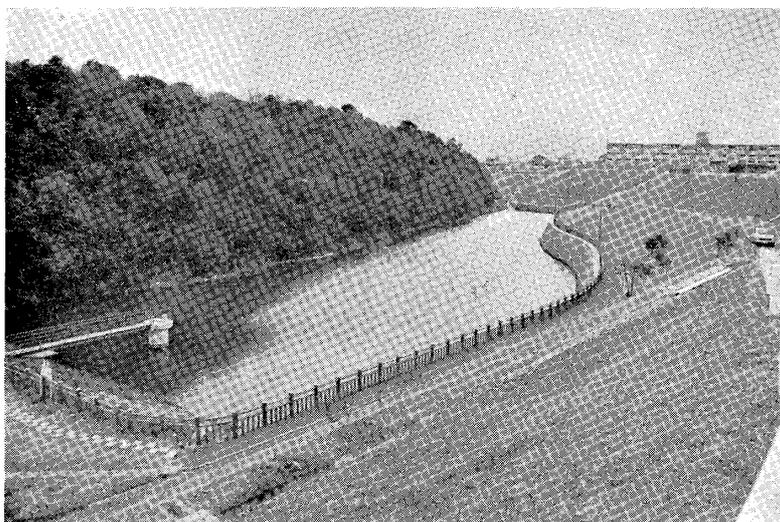


Fig. 4. A view of Ryugaike Pond and Momijigaoka Hill.

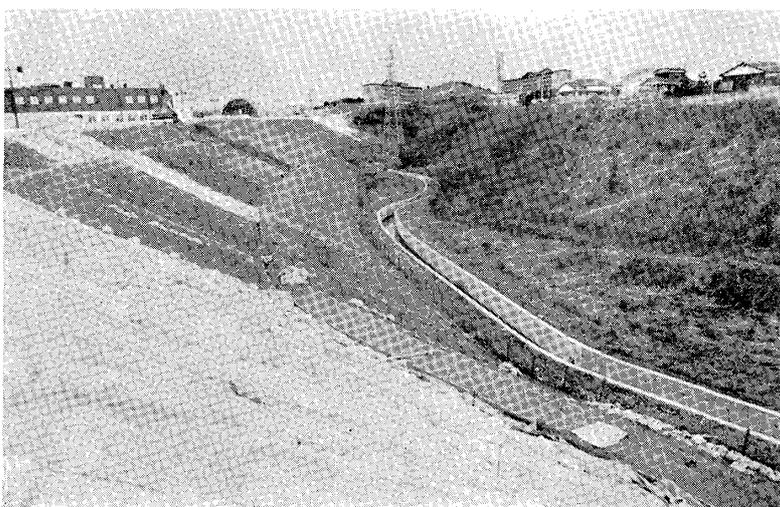


Fig. 5. Slope near the north gate. A crescent-shaped wetland is seen at center in a distance.

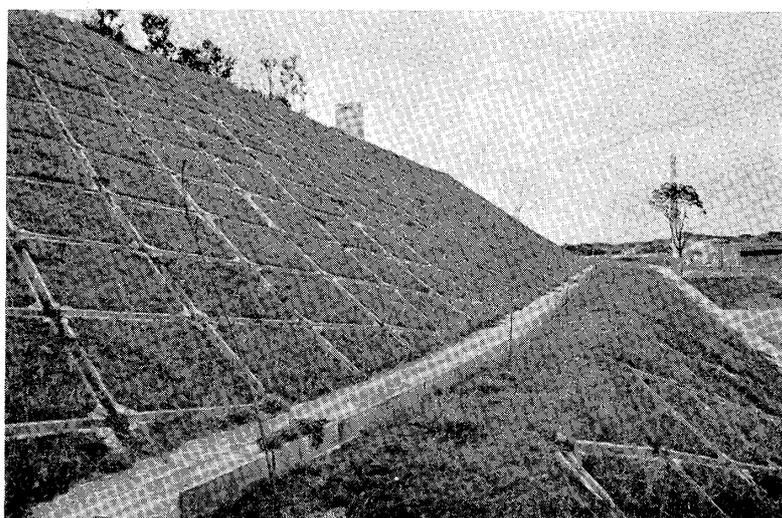


Fig. 6. A cut-off slope near the southern border of the campus.

has a rather steep slant. Sparse planting of trees is appropriate on this slope to keep open air above the trail. Trees to be planted here are *Cinnamomum camphora* and *Cyclobalanopsis glauca* and *C. gilva* as evergreen broad-leaf trees and *Prunus jamasakura* as deciduous.

5) Planting cherry trees is possible at many places on the campus. *Prunus jamasakura* is better than *P. yedoensis*, because the former species is tolerant to fungus disease. *Prunus lannesiana* (including var. *speciosa*) is another cherry tree that may be planted.

6) The wetland remaining at the northwestern corner of the campus is of special importance for science and education, and is to be carefully protected.

Literature Cited

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産業医科大学の構内および周辺地域の植生概観，および構内の環境保全について

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要 旨:

1) 医生ヶ丘をふくむ北九州市西部は，全域が照葉樹林域にある．残存林分の調査によって，沿岸地帯—内陸の原植生が推定され，医生ヶ丘一帯はスダシイ—ミズバイ群集域であることが明らかとなった．2) 現存植生の二次林は，シイ—カシ萌芽林とカラスザンショウ群落が優勢である．医生ヶ丘の二次林では，コナラが優占し，ハゼノキ・ノグレルミが常に出現する．向陽地では林床にウラジロまたはコシダが優占している．3) 湿地にはガマ・ヒメガマ・イグサが優占する．4) 医生ヶ丘で種子植物131種，シダ植物8種を記録した．5) 大学構内の緑化について，植生学の立場から付言し，特に残存林および西北部の湿原群落の保存の重要性を指摘した．

J. UOEH (産業医大誌), 3(4): 323—337 (1981)