

日本とロシアにおける自然風景のエキゾチック(日露共同研究の成果)

Exotic natural landscape in Japan and Russia

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日本とロシアの共同研究として、両国の自然風景を両国の被験者に提示し、好ましさと異国情緒性についての比較研究を実施した。日本とロシアの代表的な自然風景の写真70枚を選定し、被験者に見せ、好ましさと異国情緒性(エキゾチック)を回答させた。ロシアで学生124人、日本で学生186人、高齢者24人の回答を得た。ロシア人は日本風景だけでなく自国の風景にもエキゾチックを感じた。日本人はロシアの広大な風景や無植生の山岳風景にエキゾチックを感じた。

キーワード：自然風景の評価、エキゾチック、日本とロシアの比較

Keywords: appreciation of natural landscape, Exotic, comparison of Russian and Japanese

Table Comparison of exotics on landscape photographs between Russia and Japan

oder	N Photo	State	Location	vegetation	Russia	oder	N Photo	State	Location	vegetation	Japan
1	56	Russia	Siberia, Altai	high mounta	109	1	59	Russia	Caucasus	high mounta	202
2	23	Russia	Siberia, Puto	tundra	101	2	23	Russia	Siberia, Puto	tundra	195
3	48	Russia	Kamchatka,	high mounta	98	3	33	Russia	Siberia, Altai	steppe	193
4	33	Russia	Siberia, Altai	steppe	96	4	16	Russia	Siberia, Altai	steppe	185
5	6	Russia	Kamchatka,	high mounta	88	5	56	Russia	Siberia, Altai	high mounta	180
6	15	Russia	Siberia, Nori	tundra	88	6	7	Russia	Kamchatka,	taiga	174
7	55	Japan	Kurobe Dam	subalpine	88	7	55	Japan	Kurobe Dam	subalpine	165
8	58	Japan	Nanatsugam	deciduous	87	8	20	Russia	Kamchatka,	taiga	163
9	59	Russia	Caucasus	high mounta	87	9	45	Russia	Hibiny	tundra	155
10	19	Japan	Fukuroda fal	deciduous	85	10	46	Russia	Siberia, Puto	tundra	155
11	67	Japan	Onneto, Akai	subalpine	84	11	47	Russia	Siberia, Chit	steppe	153
12	45	Russia	Hibiny	tundra	83	12	64	Japan	Kusasenri, A	deciduous	149
13	65	Japan	Ashinoko an	deciduous	83	13	67	Japan	Onneto, Akai	subalpine	144
14	13	Japan	Mt. Fuji, Yam	deciduous	82	14	54	Russia	Siberia, Bury	steppe	143
15	46	Russia	Siberia, Puto	tundra	81	15	1	Russia	Leningrad re	taiga	136
16	20	Russia	Kamchatka,	taiga	76	16	6	Russia	Kamchatka,	high mounta	135
17	66	Russia	Siberia, Altai	high mounta	75	17	18	Japan	Kamikochi, N	subalpine	135
18	16	Russia	Siberia, Altai	steppe	74	18	62	Russia	Pskov region	taiga	134
19	60	Japan	Maryudonota	sub tropical	74	19	48	Russia	Kamchatka,	high mounta	132
20	63	Japan	Kegon fall, N	deciduous	73	20	66	Russia	Siberia, Altai	high mounta	127
			high mountain, subalpine						high mountain, subalpine		
			deciduous, mixed						deciduous, mixed		
			taiga						taiga		
			steppe						steppe		
			ever green						ever green		
			tundra						tundra		

ロシアの地理学者ア・イ・ワイコフの見た明治初期（1876年）の日本の原風景
The Original Landscape of Japan in the early Meiji Era (1876) :
from the Viewpoint of a Russian Geographer, A. I. Voeikov.

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1.なし

1.none

This report will introduce the original landscape of Japan in the early Meiji Era (1876), which was described by a Russian geographer and meteorologist, *Aleksandr Ivanovich Voeikov*.

After the conclusion of the *Kanagawa Treaty* ("Japan-US Treaty of Peace and Amity") in 1854, many people began to visit Japan from Europe and America. *Voeikov* was one of them. He came to Japan in 1876 (Meiji 9) and traveled all over Japan (from *Hokkaido* to *Kyusyu*) in only five months. After returning to Russia, *Voeikov* contributed "Travelogue of Japan" (*Puteshestvie po Iaponii*) to the *Bulletin of the Imperial Russian Geographical Society* in 1877.

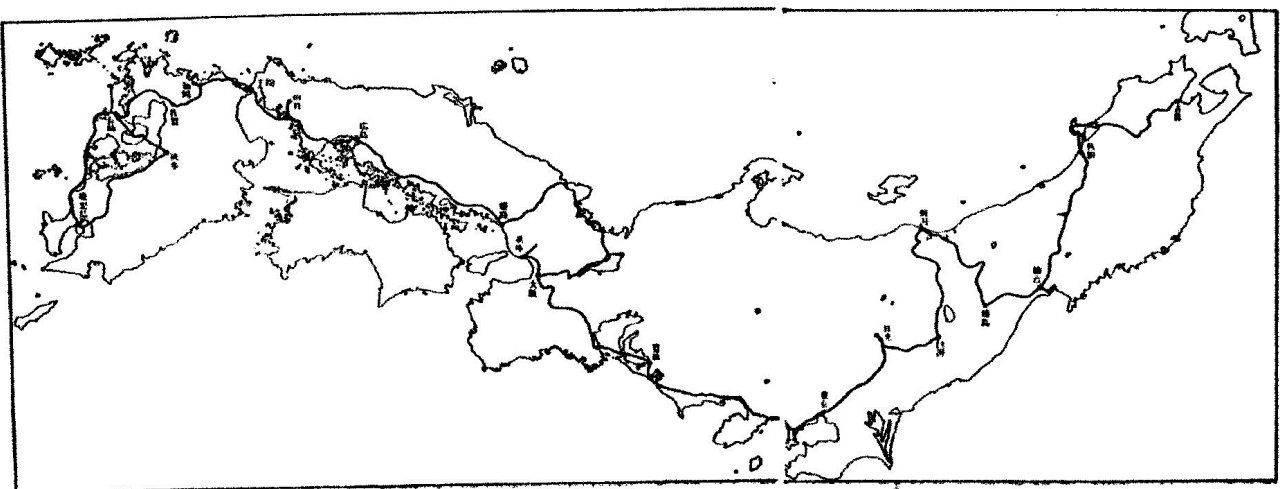
Talking of "Travelogue of Japan", it is well-known that *Isabella Lucy Bird*, an English explorer and writer, described *Unbeaten Tracks in Japan* in 1880. She came to Japan in 1878 (Meiji 11) and visited the *Tohoku*, *Hokkaido* and *Kansai* regions in seven months. But she didn't visit South-west Japan.

On the other hand, *Voeikov's* "Travelogue" is little known in Japan. An abridged(?) translation was made by *Hidetoshi Arakawa*, a Japanese famous meteorologist in 1961. But *Voeikov* observed Japan from many points of view (not only geography, meteorology, but also politics, economy, history, and culture) and in the "Travelogue" he also described many landscapes, which are now lost in the present day.

In this report I will show where *Voeikov* traveled and what he saw in Japan.

キーワード：原風景、明治時代、ア・イ・ワイコフ

Keywords: The Original Landscape, Meiji Era, A. I. Voeikov



Research on Construction and Spatial Structure of Religious Space of the Izumo Grand Shrine

Research on Construction and Spatial Structure of Religious Space of the Izumo Grand Shrine

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Research on Construction and Spatial Structure of Religious Space of the Izumo Grand Shrine

1.Introduction

In this study, the Izumo Grand Shrine will be discussed, as it is considered one of the most ancient shrines, which is supposedly the original form of a garden in a palace. The purpose is to uncover the following items: the precinct and ancient forms of rituals at the Izumo Grand Shrine, space utilization structure through annual events at the Shrine and related shrines, and history of planting formations in the precinct.

2.Study Methods

In this article, in order to clarify space utilization structure at the Izumo Grand Shrine and related shrines, and history of planting formations in the precinct, the following methods have been applied: Topographic maps, sectional views, and soil layer charts were studied together with analysis of paintings to apprehend the process of scenery changes and soil layers of each time.

3.Results and Considerations

i. From Yayoi Period until the end of the 10th Century

Based on the excavation report of Izumo Precinct remains, a flow path originating from the south of the current front shrine has been detected, and its shape was assumedly Y-shaped. There is also a record that weapon-type bronze ware and jewels (green jade jewel) from the Yayoi Period were excavated during the construction in the Kanbun Era from the east of Inochi-Nushi-No-Yashiro (one of the smaller shrines attached to the Grand Shrine).

ii. From the beginning of the 11th Century until pre-construction of the Hoji Era

Since Year 4 in the Chogen Era (1031) until the ritual transfer of the main building in Year 2 in the Hoji Era (1248), the building fell five times. The average period between a transfer until a fall was 31 years. Okano (2010) stated that it was reasonable to expect that a building without a foundation would slant due to an uneven settlement and the liquefaction phenomenon.

iii. From the construction of the Hoji Era until another construction of the Keicho Era

According to a painting which is assumed to have captured the ritual transfer of the main building in Year 2 in the Hoji Era (1248), embankment construction was completed on the east side of the precinct; therefore, the building is believed to have been constructed on the elevated ground.

iv. From the construction of the Keicho Era until another construction of the Kanbun Era

Excavation research (Year 12 of the Heisei Era) unveiled that the structure of the main building was not earth-fast construction called Hottate-bashira, but was the first trial of the cornerstone method. The design is heavily influenced by Buddhism.

v. From the construction of the Kanbun Era until another construction of the Enkyo Era

More effective equipment has been completed in order to protect the shrine from flood and debris flows. The ground was gradually elevated with stone masonry as measures to flooding and landslides. The stones used for the masonry were carved out from a giant rock behind Inochi-Nushi-No-Yashiro.

vi. After the construction of the Enkyo Era

From the construction of Kizuki Taisha, the current Izumo Grand Shrine, in the Enkyo Era until the present, construction methods have been based on construction from the Kanbun Era. A new building was constructed in the first year of the Enkyo Era (1744) with partial modifications with a new placement, and the building still remains the same shape until now.

4.Conclusion

In this paper, history of three items around Izumo Grand Shrine have been clarified: its construction, spatial structure of religious space, and planting formations in the precinct.

キーワード：神社、変遷、空間構成

Keywords: Shrine, tranisition, spacial structure

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キーワード : Shrine、transition、spacial structure

Keywords: Shrine, tranisition, spacial structure



都市における生物多様性と自然景観の保全－空間の利用調整による自然との共生－
Conservation of Biodiversity and Natural Landscape in Urban Area:
An Adjustment for Urban Space between Nature and human use

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人口の多くが居住する都市は、緑地、水域等の生物の生息生育環境が少なく、都市における自然との共生や生物多様性の保全に関する関心が高まってきている。国土交通省は、生物多様性の保全を地域づくりのために取り組むべき重要な課題としてあげており、自然の保全・再生や創出としてビオトープの計画、施工等に加え、環境の質の向上、エコロジカル・ネットワークの形成、モニタリング、適切な管理手法の構築を支援している。

里山の復活や再生、河口干潟、河川等の自然が確保された空間の保全・再生だけでなく、都市部の宅地での自然の創出や復元が望まれる。

都市空間は人工化されており自然要素が確保しにくく、人間の存在は野生生物の生息に干渉することから都市における生物多様性の保全は困難である。しかし、コンクリート等に被われた形状を持つ雨水調整池は、都市部の宅地に存在する人工的構造物の一例でありながら、植生が繁茂し鳥類が多種出現する事例としてあげられる。

雨水調整池は、1960年代に宅地の大規模開発に伴い雨水流出に対応するために設けられた。雨水専用調整池は、水難事故を防ぐため金網や柵などで囲まれ人の立入はなく、生物の生息環境となり得ている事例がみられる。凹型の形状をしているため、囲障構造物が金網等により透視性を確保している場合は、調整池外部から内部の自然を眺望することが可能となる。人の立入不可という制約が空間内に自然を保全・創出し、身近な居住環境において自然景観を視覚的に享受することができるという意味で、空間の利用調整が自然との共生をもたらすと言える。

本研究は、都市の自然が保全された空間の利用調整について整理し、生物多様性の保全と自然景観を眺める行為との共生について考察する。特に、空間への立入を禁止し自然景観を眺望するという点では、触覚を制約し視覚を可能にしていると考えられることから、知覚の利用調整に着目する。

調査は、東京都の雨水専用調整池を対象とし、植生の繁茂状況と鳥類の出現状況を把握した。また、空間の特徴を整理し、調整池周辺住民の空間内の自然に対する知覚状況を検討した。その結果、都市の人工的基盤においても自然を創出できる可能性があることが示された。調整池内の自然と視覚、聴覚、嗅覚、触覚等の多様な知覚とのかかわりが整理され、それぞれへの関係の利点と欠点が明らかとなった。調整池内の自然は、季節感をもたらすなどの効果があることが示され、自然と人間との間の境界のあり方や関わり方の議論を行うことが重要だと考えられた。

キーワード：自然景観、生物多様性、利用調整、知覚の制約

Keywords: Natural Landscape, Biodiversity, Use Adjustment, Perceptual Constraint

Landscape classification and mapping for Irkutsk city in Siberia region

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Traditional landscape approach is an important part of land-cover mapping in Russia. Since different regions have different landscape's hierarchy, it is impossible to use one classification for all the regions. We tried to analyze the correlation of such concepts as: land cover, landscape, geosystem, ecosystem, habitat, and biotope. Biotope is defined as a complex of factors, which determines physical conditions of existence (abiotic part) of a community (biotic part) to define geographical unites (Connor et al., 2004). Habitat is terrestrial or aquatic areas distinguished by geographic, abiotic and biotic features, whether entirely natural or semi-natural (EEA, 2014). Ecosystems can be regarded as groupings of habitat types (EEA, 2014). Geosystem is a unity, which consists of interrelated components of nature, controlled by regularities, which operate in geographical shell and landscape sphere (Sochava, 1974a). It is an organized integrality, which interacts with cosmic sphere and human society (Sochava, 1972). The term "landscape" is controversial and may be interpreted in different ways. However, landscape is a part of the Earth's surface, which is shaped by natural conditions and formed by human influences to a different extent (Bastian et al., 2014). Since the terms have close meanings, it is necessary to specify which term needs to be taken for certain aim. So, we defined land-cover as the complex of biotic, abiotic and cultural components on the Earth's surface (Monsin et al., 2014). The aim of this study is to compile the landscape classification of terrestrial units for Irkutsk city urban area which can be used for complex and narrow purposes, for example, for research of soil or vegetation and their changes, as well, for spatial planning. Irkutsk is a large regional center and is located on the South of Eastern Siberia near Lake Baikal. Accepted in European Union CORINE Land Cover and EUNIS habitat classification doesn't have data for the studied area. In our research, we elaborate a synthetic approach with using CORINE and EUNIS database and conception of geosystem to classify the Irkutsk's city terrestrial units. Using QGIS software we analyzed the following data: fieldwork, Digital Elevation Model (SRTM), and remote sensing (Landsat 7, 8).

Keywords: urban landscape classification, landscape approach, geosystem

大学生を対象とした緑地保全体験プログラムの内容と得られる経験の関係性

Relation between the experiences and contents of a green space conservation volunteering program for university students

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1. Introduction

Green spaces, which are a part of the urban landscape, have been conserved by public participation in Japan. However, the advanced age of the participants and the lack of sustained participation hinder the continued existence of these spaces. In an attempt to deal with these problems, a movement promoting the participation of young people in green space conservation has taken shape. It is hoped that a green space conservation volunteering (GsCV) program is provided for students. This study identifies the experiences of students who participated in such a program.

2. Methods

The object of this study was a GsCV program provided to students at Takushoku University. In the program, 14 students joined the "Rangers Project" from April to December 2015. This project conserves green spaces in Japan's metropolitan areas. The students were provided with 44 opportunities to participate in conservation activities. Each student chose and participated in four activities. The GsCV program was divided into three parts: 1) maintenance of green space (e.g. weeding and farm work), 2) PR of conservation activity at an event, and 3) fieldwork in a city. KH coder, a free quantitative content analysis software was used to analyze 14 final reports and 56 activity reports by students. Firstly, words concerning experiences were sampled from all reports by KH coder. Secondly, coding rules were set in order to count concepts with contexts which included those words identified. Finally, KH coder created co-occurrence networks that showed potential relationships between the contents of the GsCV program and experiences or on the inter-relationship between experiences.

3. Results

Contexts in the reports were classified into 14 concepts from the experiences viewpoint. The main concepts are "understanding conservation groups and CSR activities", "one significant point and one challenge in making an appeal for our activity" and "getting my new idea about conservation". The results of co-occurrence networks showed that 1) maintenance of green space was related to five concepts: "experiencing enjoyment and fulfillment", "the importance of maintenance in the conservation of a good environment", "interest in a conservation activity", "acquiring knowledge about the ecosystem or maintenance methods" and "getting an extraordinary experience" (Figure 1). 2) PR of conservation activity at an event was related to three concepts: "understanding conservation groups and CSR activities", "one significant point and one challenge in making an appeal for our activity" and "getting an extraordinary experience". 3) Fieldwork in a city was related to three concepts "acquiring knowledge about the ecosystem or maintenance methods", "a perception of the ecosystem or the history of each green space", and "a perception of the worth and significance of green spaces".

Additionally, there is a relation between "understanding conservation groups and CSR activities" and "one significant point and one challenge in making an appeal for our activity" when attention was focused on the inter-relationship between experiences. The results of co-occurrence networks

also showed that “an interest in a conservation activity” had a relationship with “understanding conservation groups and CSR activities” and “a precious interaction with other people in an activity”.

4. Conclusion

The results of this study suggest that an interest in conservation activities is increased by having experience with PR of conservation activity at an event, and that fieldwork provides a chance to understand the worth and significance of green spaces. Therefore, a GsCV program consisting of complex components is more effective than a program consisting only of maintenance of green spaces.

Acknowledgments

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キーワード：緑地、保全、体験、学生、ボランティアプログラム

Keywords: green space, conservation, experience, student, volunteering program

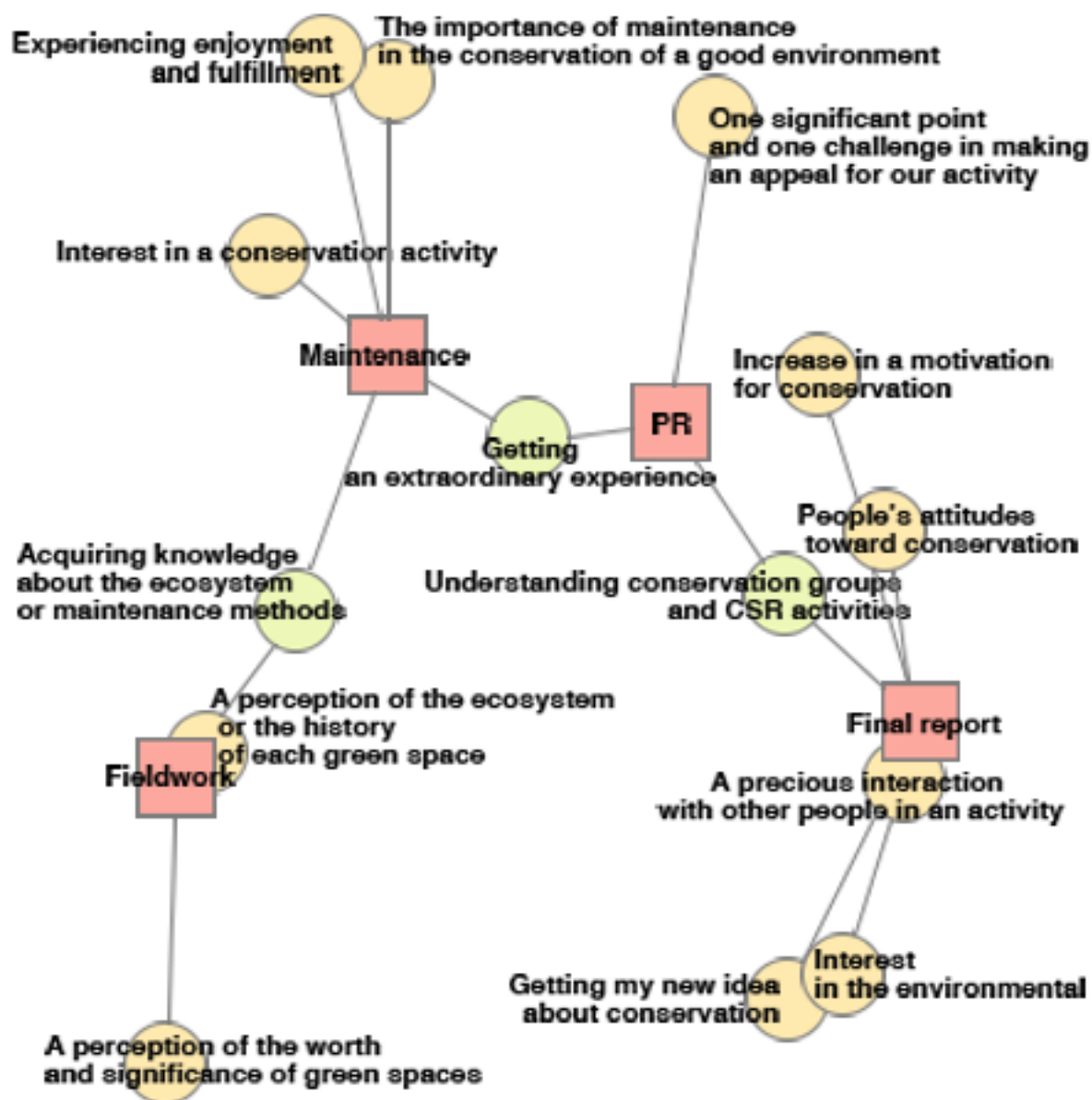


Figure1. Relationships between the contents of the GsCV program and experiences

内モンゴルフロンボイル草原におけるリモートセンシングによる植生量と炭素貯留モニタリング
Remote Sensing Estimates of vegetation Biomass and Carbon storage in Hulunbuir grassland,
Inner Mongolia

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The grassland ,as one of the most widespread terrestrial ecosystems in the world, plays an important role in regulating regional climate changes and reducing the emission of carbon dioxide. So it is important to do an accurate evaluation of grassland vegetation biomass and carbon storage , and analysis on spatial distribution patterns and environmental factors in the regional scale. Hulun Buir grassland is the study area in this paper . This study constructs grassland biomass model by integrating MODIS EVI data, climatic variables and topographic variables using RBF artificial neural network model. And aboveground biomass, carbon storage during 2000-2013 is simulated further by means of accuracy of the estimation. And With this source , the study estimates the underground biomass , total biomass and carbon storage of the study area by underground / aboveground biomass ratio in different types of grassland . The results are as follows:

The ability of RBF neural network model to estimate grassland biomass is better than multiple linear regression model. The spatial distribution of average aboveground biomass has gradually increasing trend from southwest to northeast in Hulun Buir grassland during 2000-2013. Besides the spatial distribution of average aboveground biomass has gradually increasing trend, and increased from 142.857 g/m² to 161.436 g/ m² in the rate of 1.034 / a . The total aboveground biomass, total aboveground carbon storage of study area were 8.26 Tg, 4.14 Tg·C. The total underground biomass , total underground carbon storage were 36.1 Tg, 18.06 Tg·C. The total biomass and total carbon storage were 44.4 Tg, 22.2 Tg· C. Typical steppe has the highest carbon storage, totaling 13.38 Tg·C.

キーワード：フロンボイル草原、RBFニューラルネットワーク、バイオマス、炭素貯留

Keywords: Hulun Buir Grassland, RBF artificial neural network, Biomass , Carbon storage

Seedling growth and photophysiology of *Quercus austrocochinchinensis* under two light levels

Seedling growth and photophysiology of *Quercus austrocochinchinensis* under two light levels

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Introduction

Protecting endangered species is an important part of conservation. *Quercus austrocochinchinensis* is an evergreen tree of the *Quercus* subgenus *cyclobalanopsis* Oerst. of Fagaceae. *Q. austrocochinchinensis* is an endangered oak species, which has only been identified at two sites in Yunnan province and Hainan province in China. *Q. austrocochinchinensis* is distributed in ravines in southwest China, northern Thailand, Vietnam, and Laos at elevations of 700 to 900 m. Because of tree felling, the distribution and population size of this species are both declining rapidly. At the same time, this species hybridizes with other common species, which might accelerate its extinction. The objective of this study was to compare the growth characteristics of *Q. austrocochinchinensis* seedlings under two light levels.

Q. austrocochinchinensis is an endangered oak species, which has only been identified at two sites in Yunnan province and Hainan province in China. *Q. austrocochinchinensis* is distributed in ravines in southwest China, northern Thailand, Vietnam, and Laos at elevations of 700 to 900 m. Because of tree felling, the distribution and population size of this species are both declining rapidly. At the same time, this species hybridizes with other common species, which might accelerate its extinction. The objective of this study was to compare the growth characteristics of *Q. austrocochinchinensis* seedlings under two light levels.

Material and Methods

Q. austrocochinchinensis seeds were collected from Pu-Er, Yunnan Province, in September 2011. Seeds were kept in a 4°C refrigerator before being sown on October 21, 2011. Seeds were sown in 32-cell plug trays with 60% peat and 40% perlite mix as a substrate. When the young seedlings reached 20 cm in height, they were transplanted into 18-cm plastic pots containing the same potting mixture. These seedlings were separated into two groups and grown under two different light levels in a greenhouse. The maximum PAR(Photosynthetically available radiation) of the high-light and low-light treatments was 530 and 150 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ respectively. Plant height, leaf number, and stem diameter of seedlings were measured monthly. Leaf chlorophyll content, stomatal density, chlorophyll fluorescence, and rapid light response curves were also measured at the end of experiment.

Results

Q. austrocochinchinensis had a low rate of seedling emergence (21.88%) and some seedlings died during the experiment, which may explain why *Q. austrocochinchinensis* is rare.

Seedlings differed considerably with respect to plant height, number of leaves, and stem diameter, especially the number of leaves under the low-light condition. The growth rate during the winter was slow, and growth started from February onwards. The higher number of lateral shoots on seedlings grown under the high-light conditions was of interest and might be explained by *Q. austrocochinchinensis* being shade tolerant; therefore, high light levels may have adversely affected the shoot growth of dominant seedlings.

The chlorophyll content of *Q. austrocochinchinensis* grown under high-light conditions was 3.17 mg/g for new leaves and was 2.88 mg/g for old leaves. At low light levels, the chlorophyll content of new leaves was 4.01 mg/g and that of old leaves was 3.39 mg/g. Leaf chlorophyll content of seedlings grown under low-light conditions was higher than that of seedlings grown under high-light conditions. In addition, the differences observed between new and old leaves under high light were greater than the differences observed between new and old leaves of seedlings grown under low light.

The stomatal density of *Q. austrocochinchinensis* under low light levels (318.42/mm²) was higher

than that under high light levels (286.84/mm²).

Chlorophyll fluorescence and rapid light curve, ETR raises with the increase of PAR, then reached saturation and remained stable. *Q. austrocochinchinensis* had higher ERT max under low light levels.

Conclusion and Discussion

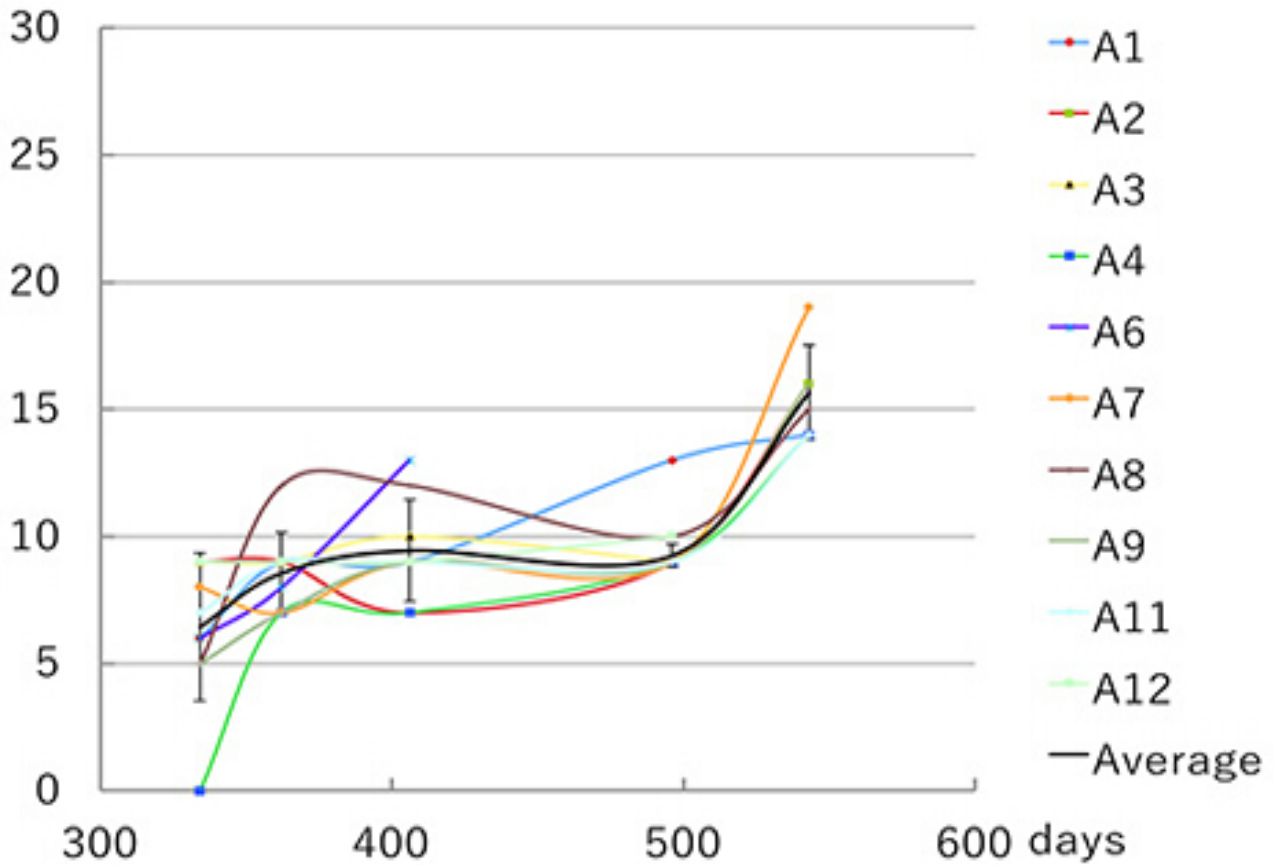
Q. austrocochinchinensis had a low seedling emergence rate, and some seedlings died during the experiment. *Q. austrocochinchinensis* presented large differences among its seedlings, suggesting that the quantity of seedlings should be increased.

Research on *Q. austrocochinchinensis* in biological engineering and physiology has been lacking. This study presents valuable information on *Q. austrocochinchinensis* and may be helpful in the recovery of this endangered species.

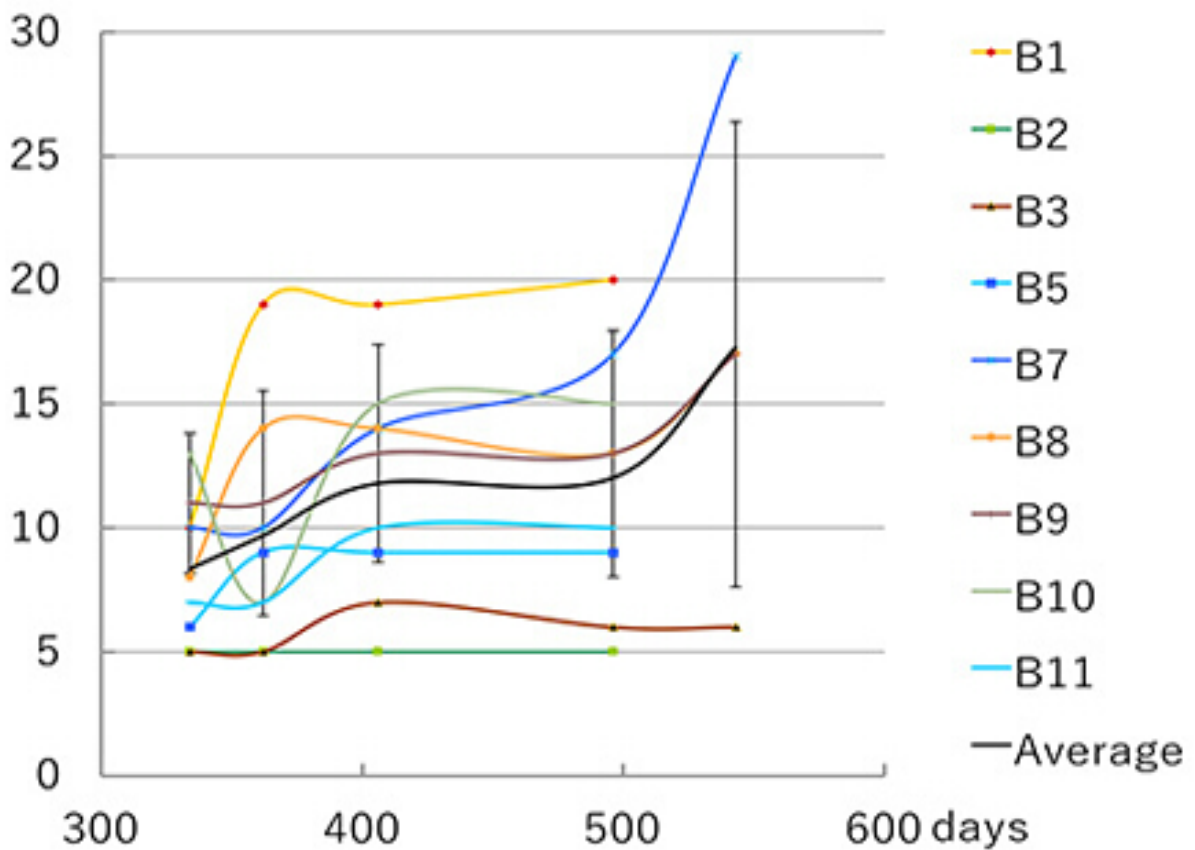
キーワード : *Quercus austrocochinchinensis*、Seedling growth、Photophysiology、Light level

Keywords: *Quercus austrocochinchinensis*, Seedling growth, Photophysiology, Light level

Number of leaves of *astrocochinchinesis* under high light



Number of leaves of *austrocochinchinesis* under low light



針葉樹二次林における森林管理が利用者の環境評価と心理的回復効果にもたらす影響
The Effect of Forest Management of Secondary Coniferous forests on User's Landscape
Appreciation and Psychological Restorativeness

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◆はじめに

ほぼ同じ林相（カラマツおよびアカマツ二次林）の未整備の針葉樹林（放置林）と整備された針葉樹林（整備林）で、利用者が懐く風景に対する印象および環境の有する回復特性等の環境評価、あるいは短時間の滞在を通じて獲得される心理的回復効果にはどのような違いが生じるのかについて調べた。

◆研究方法

実験は2014年の7月下旬に実施した。場所は東京大学富士癒しの森研究所敷地内における上記の放置林および整備林である。両プロットの面積は(0.25ha; 50mx50m)であり、森林内の物理環境については、照度を除いて気温、湿度、音圧などほぼ等しい環境であった。20~50代の男性の計18名を被験者とした。まず、順番効果を相殺するため、9人ずつ、最初に放置林に暴露され、その後に整備林に暴露されるグループ（グループA）と、最初に整備林に暴露され、その後放置林に暴露されるグループ（グループB）の二つのグループに分けた。全ての被験者は両刺激に各15分間ずつ暴露された。被験者には、両刺激への暴露前後に心理的回復効果を調べる調査票（気分(POMS)、感情(PANAS)、回復感(ROS)）への回答を依頼した。また、両刺激への暴露後に、環境評価を調べる調査票（印象評価（SD法）および環境の有する回復特性の評価（PRS））への回答を依頼した。

◆結果

Wilcoxon signed rank testによる比較結果から、環境の有する回復特性（PRS）の点からは、整備林の方が逃避、まとめ、適合性が有意 ($p < .05$) に高いことが分かった。また、印象評価の点においても、整備林の方で高い評価（明るい、開放的、快適、美しい、安心、健康的 ($p < .05$)) が得られ、物理環境の違いについても妥当な評価（放置林よりも、整然としている、混雑していない ($p < .01$)) が得られた。二元配置分散分析（環境の違い×暴露の前後）による検定結果では、気分(POMS)、感情(PANAS)、回復感(ROS)の全ての指標において交互作用は確認できなかった。一方、環境の違い（放置林-整備林）と暴露の前後（暴露前-暴露後）のそれぞれの主効果について調べたところ、環境の違いが心理的な回復に影響を与えている関係は見いだせなかった ($n.s.$)。一方、暴露の前後については、整備林に暴露することでネガティブ感情（PANAS; $p < .05$ ）や、緊張 - 不安（POMS; $p < .05$ ）に影響しそれらを低下させていた。また反対に、放置林においては、活気（POMS; $p < .05$ ）に影響し活気感を高めていた。

◆考察

整備林は環境の有する回復特性や印象評価が高い環境であったことから、整備林に暴露されることで被験者が心理的に回復した結果、ネガティブ感情や、緊張感、不安感が低下するに至ったのではないと思われる。一方、放置林で活気感が上昇した理由は、被験者が全員男性であり、別途実施した性格特性検査にて、神経症傾向が低く外向性の高い集団であったこと、また、整備林に比べネガティブに評価されていた放置林が、前述の性格特性を有する集団にとっては、たとえば、Kaplanの好ましい環境理論におけるミステリを感じさせ、探索心を引き起こすような環境となっていたことなどが考えられる。

キーワード：景観評価、心理的回復効果、森林管理、針葉樹林、回復感

Keywords: Landscape appreciation, Psychological restorative effect, Forest management, Coniferous forest, Subjective restorativeness

table 1. summary of questionnaires using the experiment and the result of analysis.

category	Landscape appreciation		Psychological restorativeness		
	SD	PRS	POMS	PANAS	ROS
abbreviated form					
official name	Semantic differential method	Perceived restorativeness Scale	Profile of mood states	Positive and negative affect schedule	Restorative outcome scale
contents	scene appreciation	restorative property of environment	mood	affect	subjective restorativeness
number of subscales	25	5	6	2	1
timing of the measurement	after exposure		before and after exposure		
wilcoxon signed rank test	M.F. was statistically higher in "brightness", "openness", "comfort", "beauty", "safeness", "healthiness", "order" and "thin" than U.F. ($p < .01$ to $p < .05$).		M.F. was statistically higher in "Being away", "Coherence" and "Compatibility" than U.F. ($p < .05$).		
two-way repeated ANOVA	mutual interaction		n.s.	n.s.	n.s.
	main effect		U.F.: vigor ($p < .05$) ↑ M.F.: tension and anxiety ($p < .05$) ↓	M.F.: negative affect (PANAS; $p < .05$) ↓	n.s.



Photo. Unmanaged Forest (U.F.)



Photo. Managed Forest (M.F.)

U. F.: unmanaged forest, M. F.: managed forest, ↑ :increased, ↓ :decreased