Chair Forest and Forestry Production

2.2.4 Laboratory : Forest Biology

Member :	Professor	Isagi, Yuji, Ph. D.
	Senior Lecturer	Takayanagi, Atsushi, Dr. Agric. Sci.
	Assistant Professor	Yamasaki, Michimasa, Dr. Agric. Sci.
	Doctor's program	4
	Master's Program	6
	Undergraduate	4
	Other	1
	Post-Doctoral fellow	1
	Program-Specific Resea	1

A. Research Activities (2010.4-2011.3)

A-1. Main Subjects

a) Genetic traits and biological conservation of forest plants

Regeneration process and genetic structure of plant community in forest ecosystems were analysed by means of field researches and genetic analysis. In order to conserve biological diversity of forest, fine genetic markers were developed for a variety of plant species. Analyses of genetic structure and genetic diversity for endangered plant species were conducted.

b) Biodiversity conservation based on ubiquitous genotyping of critically endangered plant species

We conducted research to obtain general understanding of biological/genetic characteristics of endangered plant species, and establish rational methods to conserve biodiversity based on the genetic analysis for all remnant individuals of critically endangered plant species. The result of the research will directly contribute to the conservation measures of endangered species and the establishment of new approach for biodiversity conservation.

c) Big mammals management and forest conservation

The influence of Habitat Use Intensity (HUI) of sika deer (Cervus nippon) on vegetation was studied under controled foraging conditions. Deer herbivory was controled by periodically closed fences. As Deer HUI go down, then biodiversity goes up. But some species will decrease according to HUI declining, even though they are palatable. To conserve plant community with higher biodiversity, it is better that various HUI sites exist in a mosaic. Preparatry Analysis of grazing-growing balance by photo was conducted.

d) Studies on Japanese Oak Wilt

The ambrosia beetle, Platypus quercivorus, causes Japanese Oak Wilt by transporting pathogenic fungi from trees to trees. Number of offspring per one hole of P. quercivorus ranges from zero to over 300. Factors affecting the rate and amount of reproductive success of P. quercivorus were studied by setting the emergence traps on each entrance hole on the trunk surface of Quercus crispula killed by this disease. The reproductive success rate of P. quercivorus was high on the hole bored at the concave trunk surface of low level. The amount of reproductive success was maximized when the density of holes was medium level. Non-linear effect of hole density on the reproductive success of P. quercivorus was supposed to be caused by both of the Allee effect and competition for the space to construct galleries.

A-2.Publications and presentations

a) Publications

Books

- Isagi Y (2011) Significance of single-pollen genotyping in ecological research., In Isagi Y & Suyama Y (eds.), Single-Pollen Genotyping. Springer, pp. 1-6.

- Matsuki Y, Tomita M, Isagi Y (2011) Pollination efficiencies of insects visiting Magnolia obovata, as determined by single-pollen genotyping. In Isagi Y & Suyama Y (eds.), Single-Pollen Genotyping. Springer, pp. 17-32.

- Kondo T, Nishimura S, Naito Y, Tsumura Y, Okuda T, Ng KKS, Lee SL, Muhammad N, Nakagoshi N, Isagi Y (2011) Can tiny thrips provide sufficient pollination service during a general flowering period in tropical rainforest?. In Isagi Y & Suyama Y (eds.), Single-Pollen Genotyping. Springer, pp. 63-82.

Original Papers(including book-reviews)

- Masumoto I, Kaneko S, Ohtake K, Isagi Y (2011) Development of microsatellite markers for Adenophora palustris (Campanulaceae), a critically endangered wetland plant species in Japan. Conservation Genetics Resources 3: 163-165.

- Mitsui Y, Nomura N, Isagi Y, Tobe H, Setoguchi H (2011) Ecological barriers to gene flow between riparian and forest species of Ainsliaea (Asteraceae). Evolution 65: 335-349.

- Ando H, Kaneko S, Suzuki H, Horikoshi K, Chiba H, Isagi Y (2011) Lack of genetic differentiation among subpopulations of the black-footed albatross on the Bonin Islands. Journal of Zoology 283: 28-36.

- Sakaguchi S, Sakurai S, Yamasaki M, Isagi Y (2010) How did the exposed seafloor function in postglacial northward range expansion of Kalopanax septemlobus? Evidence from ecological niche modelling. Ecological Research 25: 1183-1195.

- Kubo M, Shimano K, Sakio H, Isagi Y, Ohno K (2010) Difference between sprouting traits of Cercidiphyllum japonicum and C. magnificum. Journal of Forest Research 15: 337-340.

- Futai K, Isagi Y, Watanabe H (2010) The distribution pattern of Heritiera littoralis Dryand. on the Ryukyu Islands as affected by seed dispersal via ocean currents. Tropics 19: 21-27.

- Yamazaki Y, Kaneko S, Naoe S, Masaki T, Isagi Y (2010) Isolation and characterization of 11 microsatellite loci in Swida controversa (Cornaceae). Conservation Genetics Resources 2: 145-147.

- Bowman DMJS, Brown GK, Braby MF, Brown JR, Cook LG, Crisp MD, Ford F, Haberle S, Hughes J, Isagi Y, Joseph L, Mcbride J, Nelson G, Ladiges PY (2010) Biogeography of the Australian monsoon tropics. Journal of Biogeography 37: 201-216.

- Mizuki I, Yamasaki M, Kakutani T, Isagi Y (2010) Negligible impact of deer-induced habitat degradation on the genetic diversity of extant Bombus diversus populations in comparison with museum specimens. Journal of Insect Conservation 14: 191-198.

- Takahashi A, Ichihara Y, Isagi Y, Shimada T (2010) Effects of acorn tannin content on infection by the fungus Ciboria batschiana. Forest Pathology 40: 96-99.

- Mitsui Y, Isagi Y, Setoguchi H (2010) Multiple spatial scale patterns of genetic diversity in riparian populations of Ainsliaea faurieana (Asteraceae) on Yakushima Island, Japan. American Journal of Botany 97: 101-110.

- Crisp MD, Isagi Y, Kato Y, Cook LG, Bowman DMJS (2010) Livistona palms in Australia: Ancient relics or opportunistic immigrants? Molecular Phylonenetics and Evolution 54: 512-523.

- Sawa A, Kaneko S, Isagi Y, Mariko S, Masaki T (2010) Development and characterization of microsatellite markers for Prunus verecunda and Prunus grayana (Rosaceae). Conservation Genetics 11: 1167-1169.

b) Conference and seminar papers presented

- The 58th Annual Meeting of the Japanese Ecological Society (21 presentations)

- The 122nd Annual Meeting of Japanese Forestry Society (6 presentations)

- 2010 Annual Meeting of the Ornithological Society of Japan (1 presentation)

- 42nd Annual Meeting of the Society for the Study of Species Biology (2 presentations)

- The 74th Annual Meeting of the Botanical Society of Japan (1 presentation)

- XXIII IUFRO World Congress (2 presentations)

- East Asian Botany, International Symposium 2011 (3 presentations)

- 5th International Symposium-Workshop on Frugivores and Seed Dispersal (1 presentation)

- 7th Internationl Deer Biology Congress (1件）

A-3.Off-campus activities 1

<u>Membership in academic societies</u>

- Isagi, Yuji : The Japanese Forest Society (Exective Director), The Ecological Society of Japan (Journal of the Ecological Society of Japan, Editor; Committee for the Kinki District, Selection Committiee for the Prizes of the society), The Society for the Study of Species Biology (Selection Committiee for the Kataoka Encouragement Prize)

- Takayanagi, Atsushi : The Mammalogical Society of Japan (Manegement Special Committee)

A-3.Off-campus activities 2

Research grants

1. Grants-in-aid for Scientific Research(KAKENHI)

- Scientific Research (A) : Isagi, Yuji : Comprehensive conservation of biodiversity hot spots based on information from ubiquitous genotyping

- Scientific Research (C) : Yamasaki, Michimasa : Host tree and borehole site selection by the ambrosia beetle Platypus quercivorus

2.Other Research Grants

- Enviromnent Research and Technology Development Fund : Isagi, Yuji : Biodiversity conservation based on ubiquitous genotyping of critically endangered plant species

A-4.International cooperation and overseas activities 2

Visiting Research Scholars

- Postdoctoral Fellowsjips for Foreign Reserchers　1（Australia）

B.Educational Activities(2010.4-2011.3)

B-1.On-campus teaching

a) Courses given

- Undergraduate level : Basic Science for Forest and Biomaterials IV (Isagi), Reproductive Ecology in Forest Trees (Isagi), Wildlife Conservation Science (Takayanagi), Laboratory Course in Forest and Biomaterials Science I (Takayanagi), Laboratory Course in Forest and Biomaterials Biology (Takayanagi, Yamasaki), Basic Laboratory Course in Ecology (Isagi, Takayanagi, Yamasaki), Laboratory Course in Applied Ecology (Isagi, Takayanagi, Yamasaki), Practice in University Forests II (Takayanagi), Seminar in Forest and Biomaterials Science (Isagi, Takayanagi, Yamasaki)

- Graduate level : Forest biology I (Isagi), Seminar in Forest Biology (Isagi, Takayanagi, Yamasaki), Laboratory Course in Forest Biology (Isagi, Takayanagi, Yamasaki)

B-2.Off-campus teaching etc.

Part-time lecturer

- Takayanagi, Atsushi: Faculty of Bioenvironmental Sience, Kyoto Gakuen University (Wildlife Coservation Sience)

- Yamasaki, Michimasa: Faculty of Engineering, Doshisha University (Life Science II, Animal Behavior)

C.Other Remarks

- Isagi, Yuji : Research and development projects for application in promoting new policy of agriculture, forestry and fisheries (evaluation committee), Hiroshima University Museum (guest scientist), Tokyo Metropolitan University (guest scientist)

- Takayanagi, Atsushi : Odaigahara nature restration projects evaluating committee, Isaki National Forest Cormorant Management Working Group, Kyoto Prefecture Wildlife-Village Relationship Construction Projects Adviser , Kyoto Prefecture Gree Action Plan Committee, Shiga Prefecture Deer Management Committee, Shiga Prefecture Blak bear Management Committee, Shiga Prefecture Japanese Mankey Management Committee, Shiga Prefecture Red Data Committee, Fukui Prefecture Deer Management Committee, Fukui Prefecture Black bear Management Working Group, Fukui Prefecture Environmental Council Wildlife Division, Hyogo Prefecutre Wildlife Management Council, Hyogo Prefecture Environmental Council Wildlife Division, Osaka Prefecture Goshork Conservation Committee