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21Century COE Program and a Proposal for Establishing a Consortium of Biodiversity
Research and Sustainable Development in Asia and Pacific Regions

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The 21st Century COE (Center of Excellence) Program has been promoted by the Ministry of Education, Culture, Sports, Science and Technology, Japan, since 2002. Its purpose is to provide prioritized assistance for the formation of global research and education centers by introducing the principle of competition and to create internationally competitive universities of the highest quality in the world. This program is expected to foster young researchers and promote university education reform. Based on our fundamental principles, the 21st Century COE Program of our university aims to provide comprehensive analyses of biodiversity in coral reef and island ecosystems while establishing our university as an international center for research and education concerning these issues. Through our COE program, we are making every effort to accomplish this goal through research and education rooted in the unique characteristics of Okinawa's natural environments, southern Japan.

Flora and fauna of the Ryukyu Archipelago have been formed throughout the geological processes of a land bridge formation and its subsequent fragmentation. It is influenced by a mild and moist climate caused by the Kuroshio Current and monsoons. From a global perspective, the natural environment in Okinawa is rich in important and attractive components for research in the field of biodiversity. To work on current environmental problems, various issues related to coral reefs and the archipelago environment must be addressed on a global scale. Okinawa, the only area in Japan having such a natural environment, should have an important role in promoting research related to these issues. Information collected locally can be applied globally by sharing the results of our studies. Thus, it is essential that our university serves as an international center for research and education. Our university's environment can encourage the gathering of students and researchers from domestic and abroad locales to conduct unique research activities related to biodiversity.

In this COE program, we regard the marine and terrestrial environment of subtropical islands as a single large ecosystem. Researchers from multiple fields collaborate in research and education regarding the evolution and the mechanism of biodiversity retention in the Ryukyu Islands. Methodologies from molecular biology to ecology are employed to examine terrestrial and marine phyla from microorganisms to higher plants and vertebrates. We thus aim to establish an international research and education center in the Asia Pacific region to encourage young researchers. In addition, we aim to demonstrate the value of the Ryukyu Islands as the "Galapagos of the Orient," and to generate novel comprehensive science for studying the biodiversity of this area.

By taking advantage of Okinawa's unique environmental features, following objectives of the University of the Ryukyus to collaborate with other institutes in the Asia Pacific region and making a valuable local contribution, we will offer programs such as international summer courses and international symposiums/workshops in English. We will also conduct research and provide education regarding the biota and biodiversity of the Ryukyu Islands. Personnel in charge of program promotion, together with prominent researchers invited from abroad, will participate in the education of domestic and foreign doctoral students, and will conduct joint studies to establish the center for research and education. As many countries in the Asia Pacific region have common environmental problems and research topics, it is important to establish in the University of the Ryukyus as a base for research and education concerning these issues.

This program will result in, 1) University of the Ryukyus playing a pivotal role in research on coral reef and island ecosystems in the Asia Pacific region, where the center for important research and education is established, 2) The development of young researchers who will be expected to contribute to international studies, by means of the promotion of international summer courses and joint studies, 3) Rapid progress of research, due to the construction of new science in generation or dynamics of biodiversity, or comprehensive analyses of the retention mechanisms of biodiversity, and 4) Academic grounds for natural regeneration (or bioremediation) from disturbances for Okinawa, as well as the global environment. The program is expected to yield these results, in addition to providing new innovations in academic study and the development of young researchers.

Furthermore, I would like to propose an idea for an international cooperative program to foster young scientists working with global aspects. This consortium is for biodiversity research on coral reef and island ecosystems and sustainable development in the Asia and Pacific regions. It would be an international cooperative PhD program in this region. Institutions participating in this consortium will provide summer courses or regular courses for PhD students within the program. Students can accumulate necessary credits from different institution(s), including their own, and gain useful knowledge from varied environments. Credits will be given by the home institutions and tuition will be free. In some cases, faculty members will be invited to give lectures for the summer courses offered by other institutions.

Cooperative research is also an important aspect in this consortium because there are numerous common research topics in the Asia and Pacific regions, particularly for biodiversity studies and sustainable development. Members of all institutions should make an effort to get and provide research budgets in various ways and develop the cooperation.

These programs are strongly expected to contribute to the development of a new, integrated science of biodiversity and to the sustainment of our important environments in the coral reef and island ecosystems in this region.