

# BioResource now !

Our monthly newsletter features a variety of information, highlighting current domestic and international issues concerning bioresources.

Hot News from Abroad No.19

## Searching for the origin of Japanese oats in south China

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Research Institute for Bioresources, Okayama University

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Let's explore  
"Naka no Hito (insider)" !



Hot News from Abroad No.19

## Searching for the origin of Japanese oats in south China

– Collection of Genetic Resources of Oats in North Guizhou Province and East Yunnan Province –

Kazuhiro SATO, Associate Professor  
Research Institute for Bioresources, Okayama University



Varieties of wheat ears obtained from a farmhouse

Using the Grant-in-Aid for Scientific Research (A) "Genetic assessment and developmental research of crop resources distributed in China and adjacent countries (4th)" (Kazuyoshi Takeda, Director, Research Institute for Bioresources, Okayama University) and in collaboration with the Kunming Institute of Botany, Chinese Academy of Sciences, we collected and investigated the genetic resources of barley and wheat in Guizhou and Yunnan provinces in south China. An overview of our work follows.



Guizhou and Yunnan provinces are both located in southwest China at a latitude that is approximately the same as that for Okinawa Prefecture. By driving, we covered an area of 3,000 km in 10 days and collected approximately 140 barley and wheat samples from 52 collection sites along the way. All the samples were mixtures of multiple strains, and hence, it is expected that the total number of collected strains was approximately 300.

The Han Chinese live in most of the collection regions, while there were some settlements where only ethnic minorities such as the Miao live. Since diet differs among ethnic groups, it was important to know the ethnic background of each region from where the cereals were collected.



Drying noodles at a noodle factory

For example, since barley is a primary dietary constituent for the Tibetans, naked six-row barley is easily obtainable, and in the areas where brewing alcohol from barley is common, hulled two-row barley is often used. Whether an ethnic group is accustomed to eating steamed buns or noodles made from wheat can be determined based on whether wheat is cultivated in the area.

Harvest time and climate are also important. The altitude of the target collecting regions was from 700 m to 3,000 m, and hence, the sampling areas were extremely varied. From previous experience of sample collection in Yunnan Province, spring-sown cultivation (sown in spring and harvested in summer) is primarily practiced in the regions 3,000 m above sea level or higher, while autumn-sown cultivation (sown in autumn and harvested in spring) is practiced in the regions below 3,000 m above sea level. The altitude of the target areas of our investigation was 3,000 m or lower, and hence, no spring-sown cultivation was observed. Since our visit was in July, the autumn-sown barley, which is generally harvested around May, had already been harvested.



Members of the investigation group in front of a fence of a farmhouse drying barley in Yunnan Province.

There are several methods for acquiring samples. Ears of grain could often be obtained directly from farmhouses where samples were dried before threshing or straw was stacked after threshing. This is advantageous because the morphology of the ears could be examined at the time of sampling. However, most of the samples in this season are seeds stored after threshing, and hence, we made inquiries and collected samples from farmhouses in each collecting area. An interesting aspect of stored seeds is that many strains can be collected from a small number of seeds. Fairs are frequently held in each area, and farming families sell home-grown wheat at these fairs; we could obtain representative samples of each area from these fairs. In most regions, the wheat seeds were mixed with barley and usually hulled.

The usage of crops is also important when investigating diversity. Since wheat is frequently consumed as noodles in the collecting regions and even small villages have a noodle factory, samples could be obtained during our visits. Wheat is also often used in the manufacture of home-made miso or hishio (fermented condiment) that are used as important seasonings. In addition, naked oats are roasted for human consumption in some areas. Barley is used as livestock feed. Aside from chickens and ducks, barley is often fed to pigs too. Therefore, samples could be efficiently obtained from farmhouses with pig pens. In addition, in the collecting regions, the cultivation of barley as food or for brewing was not recognized at this time.



Home-made hishio made from wheat

The samples collected during our investigation were primarily stored seeds obtained from farmhouses; therefore, we had no other option but to determine the diversity of seeds in terms of their morphologies and colors. The wheat seeds were extremely patchy, and numerous strains appeared to be conventionally cultivated. Moreover, in some regions, seeds of multiple strains are consciously mixed and cultivated. It appears that these farmhouses empirically select this method of cultivation; the mixed cultivation of multiple strains is an agriculturally meaningful method as a measure against pests and drought. Some samples were obtained with ears; we sorted these strains according to morphology and found that mostly, several



Threshing using automobile tires on straw laid on a road, and the sampling of wheat ears.

strains were mixed. On the other hand, barley samples were often mixed with wheat; hence, it was difficult to determine the degree of diversity. Whether these strains of barley were cultivated together with wheat in fields or were mixed with wheat at threshing is unclear; however, it is natural to assume the former is true since barley matures rather early in general. Accordingly, there is a high possibility that these strains of barley vary with the farmhouses from where they were obtained. Further, a few naked barley grains were also collected but were different from the barley strains cultivated by the Tibetans, which exhibit diverse variations as presumed from characteristics such as grain color.

Download the PDF version of this newsletter at  
<http://www.shigen.nig.ac.jp/shigen/news/>

Other information on bioresources is available at

NBRP <http://www.nbrp.jp/>  
SHIGEN <http://www.shigen.nig.ac.jp/indexja.htm>  
WGR <http://www.shigen.nig.ac.jp/wgr/>  
JGR <http://www.shigen.nig.ac.jp/wgr/jgr/jgrUrlList.jsp>

October 25–28, 2007  
"2nd International Biocuration Meeting" at Dolce Hayes Mansion, San Jose, CA, USA  
Details are available at the following website:  
<http://biocurator.org/Mtg2007/>

"BMB 2007" (The 30th Annual Meeting of the Molecular Biology Society of Japan & The 80th Annual Meeting of the Japanese Biochemical Society)  
December 11-15, 2007 : Panel exhibitions of NBRP are scheduled.

Cell Technology initiated a new series entitled "Let's Use! BioResource". Bioresources in Japan will be introduced in a series of 14 volumes from November 2006 to December 2007.

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The extensive corn fields and mixed cultivation of beans may be the result of a policy of the Chinese government. Based on morphology, the corn strains were obviously improved varieties, and the seeds were apparently abundantly produced. It appears that oats are rarely cultivated as a succeeding crop after corn, and at an interview, it was revealed that oats had been cultivated before the introduction of corn several years ago. Thus, conventional oat strains have been disappearing rapidly; therefore, collecting genetic resources of oats is a difficult task.



Varieties of barley ears obtained from a farmhouse

※ The picture was provided by Dr. Sato from Okayama University.

## National BioResource Project 2007 !!

The following 13 applications were additionally accepted into the National BioResource Project 2007.

Details are available at the following address ---- <http://www.nbrjp.jp/>

Program Name	Organism Name	Project Title	Representative Institute	Research Representative
Core Center Establishment Program	<i>Ciona intestinalis</i>	Establishment of the Core Resource Center for Marine Invertebrates	Graduate School of Science, Kyoto University	SATO Noriyuki
	Tomato	Establishment of the Core Center for Tomato Bioresources	Graduate School of Life and Environmental Sciences, University of Tsukuba	EZURA Hiroshi
	Cellular slime molds	Establishment of Distribution System of Cellular Slime Molds Resources	Graduate School of Life and Environmental Sciences, University of Tsukuba	URUSHIBARA Hideko
	<i>Bacillus subtilis</i>	<i>Bacillus subtilis</i> Genomic Resources	National Institute of Genetics	NIKI Hironori
Genomic Information Program	Medaka fish	Full-length cDNA Resources of Medaka Fish	National Institute for Basic Biology	NARUSE Kiyoshi
	<i>Drosophila</i>	Genome and Property Information for the Quality Control of Strains	National Institute of Genetics	UEDA Ryu
	<i>Arabidopsis</i>	Sequence Analysis of Entire Full-length cDNAs of <i>Theilungiella halophila</i> as New <i>Arabidopsis</i> Resources	RIKEN BioResource Center	KOBAYASHI Masatomo
	Wheat	Full-length cDNA Resources of Bread Wheat	Kihara Institute for Biological Research, Yokohama City Univ.	OGIHARA Yasunari
Fundamental Technology Development Program	Mouse	Novel Gene Knock-out Method based on NMD Inhibition	Graduate School of Biological Sciences, Nara Institute of Science & Technology	ISHIDA Yasumasa
	<i>Drosophila</i>	Development of a Long-term Stable Preservation Technology of Strains	DGRC, Kyoto Institute of Technology	YAMAMOTO Masa-toshi
	Mouse/Rat	Development of Transport Systems of Experimental Mouse and Rat Resources	RIKEN BioResource Center	YOSHIKI Atsushi
	Medaka fish	Development of Standard Strains for the Functional Analysis of Medaka Genes	National Institute for Basic Biology	TANAKA Minoru
	DNA (animals, plants, microbes)	Development of the Long-term Preservation Technology of Genetic Resources	RIKEN BioResource Center	KOBAYASHI Masatomo

The topic of focus in the next issue will be  
**"Algae Resources."**  
 Hope you are looking forward to it!

## 10 minutes Information Technology - 25 -



### Let's explore "Naka no Hito (insider)" !

Naka no Hito, an unconventional access analysis service has started since this April. Since a considerable number of people have provided introductory articles when this service began, you might have known about this service already.

「Naka no Hito」 <http://nakanohito.jp/> (Japanese only)

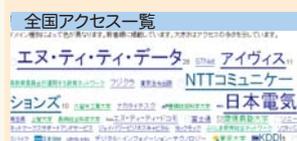


Fig.1: List of Accesses

Most access analysis services display the domains that have visited your website. However, Naka no Hito does not display domains but goes one step further to display the name of the organizations that have visited your website (Fig. 1).

Organizations displayed by Naka no Hito are limited to business enterprises, governmental institutes, schools, and corporations and do not include providers. However, compared to services that only display domains, you can easily identify the organizations of your visitors which makes it easier to understand who views your website. You can clearly see the difference when compared to the sources shown by Google Analytics (Fig. 2).

参照元	セッション	平均ページ
1. 000000	381	2.69
2. 000000	333	2.81
3. 000000	214	1.32
4. 000000	76	2.09
5. 000000	74	2.11

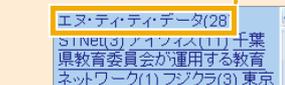
Fig. 2: A Traffic Sources Page of Google Analytics

Location of visitor is displayed.



Fig. 3: Access Map

In addition, Naka no Hito can display the location of your visitor on a map of Japan (Fig. 3). If you click on the link of a visitor on the right side of Fig. 3, the location of that visitor will be displayed on a mini map on the top left. As an example, NTT data was clicked and then the NTT data building was displayed on the mini map.



The "footprinting function" is also available, and hence, you can find out how often an organization visits your website (Fig. 4).

時刻	所属組織	初回
01:05	エヌ・ティ・ティ・データ(20)	4ヶ月前
3日前 15:12	STNet(10)	3ヶ月前
3日前 12:29	アイブイ(11)	3日前
3日前 10:44	千葉県教育委員会が運用する教育ネットワーク(2)	3日前

Fig. 4: Footprinting Directory

Naka no Hito can only be accessed from within Japan. Nevertheless, the service commands outstanding visibility in terms of the recognition of reference sources. I recommend that it be tried at least once.

(Tohru WATANABE)

**Editor's Note:** According to recent news, global wheat production has decreased, while the price of wheat is rising. The causes for this phenomenon appear to be to the transition to the cultivation of corn that is used as a bioethanol and the extensive droughts in Australia. For Japan, which relies on import to fulfill 90% of its national wheat requirements, the global wheat business is now a matter of importance.

Those who have heard of "Naka no Hito" previously must be uncharacteristically well informed! Those who think that this information is jargon, please refer to Wikipedia. (Y.Y.)

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