BioResource Now !

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Focus

The Meanings of Weed and Weed Types

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Many of cultivated plants are so-called weed-type. Is the term "weed" as used in weed rice, weed barley, weed watermelon, and weed sunflower an academic term? Is weed type different from wild type? In this article, I would like to clarify the meaning in which the term "weed (type)" is used, especially regarding the cultivated plant species.

As an academic term, the word weed is originally defined as a plant that hinders agricultural development by its overgrowth in the fields. This could be the reason for both "Gaisou" (harmful grass) and "Zasso" (weed) being used synonymously during the Meiji Era; however, over time, the terms were integrated with the term "Zasso" (weed). In contrast, the classifications of plant groups that grow in the human living sphere have evolved in plant ecology. Many plant species that grow in croplands, waysides, and other open spaces do not inhabit areas without human intervention. Although they are often called very sturdy, weeds cannot reinforce their strength in the absence of human intervention and are, thus, tough only in their own environment. Therefore, as defined by Yasuo Kasahara, weeds are a group of plants that do not grow continuously without external intervention or decomposition of surviving areas. Studies have been conducted to determine common ecological properties among such plant groups. The agricultural and ecological definitions of "weeds" coexist, in Europe and the United States.

Then, what does the term "weed type" indicate when it refers to a homogeneous or related species of cultivated plants? First, in a broad sense, "weeds" exhibit wild-type traits and disseminate seeds without human intervention (or via propagules) to maintain groups of individuals. In cereals, an easy-to-understand discriminative trait is drop seed (shattering habit) exhibited by wild type (or occasionally referred to as weed type) species, where the ripe seeds that produce abscission layers are dropped, while those that do not exhibit this trait are called the cultivated type.

However, researchers who use the term "weed types" often distinguish this from the term "wild types." In this viewpoint, the ecological definition of weeds is considered. "Wild type" often refers to a group of plants that grow over generations, independent of human intervention, whereas "weed type" often indicates plants that grow in destabilized environments within farmlands or nearby human beings and may die without human intervention. For example, *Oryza rufipogon*, a wild-type ancestral species of Asian rice, is a prostrate plant that typically inhabits wetlands such as riversides. However, what people often call "weedy rice" is actually a rice species that grows in paddy fields with straight plant bodies and displays shattering habit. Further, they resemble cultivated rice with the exception of the shattering habit. Likewise, in a farmland in India or Africa, we may often find wild melons that bear fruits of 4 cm in length inside the fields or along the hedges. These fruits may also be considered a weed type because of their growing environment.

Photo: A weed type melon (left) and weed type moth bean (right) that was photographed in Gujarat, India.

The following possibilities may be considered as the origin of weed type of cultivated plants that grow in or nearby farmlands: (1) Weeds have been growing around crops from the time the crops were domesticated.

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(2) Weeds derived from mutations or hybridization and recombination of cultivated plant varieties. (3) Weeds are derived from recent hybridizations between cultivated- and wild-type species. Although all these plant types have conventionally been labeled as “weedy,” Gressel coined the term “feral” for those plants described in (2) and (3) in 2005, after the term was used for animals. The term has been increasingly accepted for use in plant descriptions. Meanwhile, plants that are grown from crop seeds accidentally dropped outside the targeted farmland areas are not called feral, but as volunteers. For example, Noraimo (stray potato), which has become an issue in Hokkaido in the recent years, is a volunteer potato.

Moreover, the term “weedy” does not always indicate a weed type of cultivated plant, but rather implies that a farmland is riddled with weeds. For example, a wheat field that is fully covered with weeds because of a lax or oversight may sometimes be referred to as “weedy wheat.”

Create a website for smart phones by drag & drop method!

Ongoing Column [No. 71] 10min.

How many people around you have smart phones? According to the survey results of D2C Inc. (※1), the prevalence rate of users with smart phones is 23.6% as of February 2012. Websites that can be viewed using PCs can now be viewed by smart phones without problems. However, because the smart phone screen sizes are smaller than that of PCs, these websites are optimized for smart phone browsing by the users. Nevertheless, it is still difficult to write codes for smart phones from the beginning. Thus, the issue is to create a website for smart phones.

Here, I introduce “Codiqa” (※2), which is an application that allows you to intuitively create a website prototype for smart phones based on jQuery Mobile (※3) via dragging and dropping the parts required to create a webpage in a browser. jQuery Mobile uses a JavaScript framework that is optimized for smart phones with iOS (Apple) or Android.
Users will need to create an account in the Codiqa website, not in jQuery Mobile, after which the latter is used.

1) After accessing the jQuery Mobile website, a message will appear in the middle of the page that reads, “Easy to use: Try it now!” as shown in Fig. 1.

2) From among the parts in the green column ① shown in Fig. 1, drag and drop the parts to be added into the green column ②.

Fig. 1: The webpage-creating window

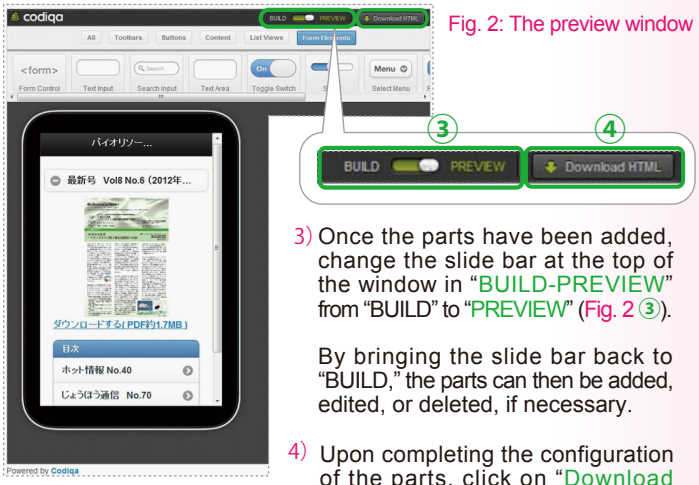

Fig. 2: The preview window

3) Once the parts have been added, change the slide bar at the top of the window in “BUILD-PREVIEW” from “BUILD” to “PREVIEW” (Fig. 2 ③).

By bringing the slide bar back to “BUILD,” the parts can then be added, edited, or deleted, if necessary.

4) Upon completing the configuration of the parts, click on “Download HTML” in Fig. 2 ④ to download a file that includes the webpage. Please note that the data on the created webpage will be lost if the browser is closed without downloading the file.

The downloaded file may be released as it is or the file details may be edited. I highly recommend all users to use jQuery Mobile at least once to easily create a website for smart phones.

(Gaku Kimura)

※1. Investigation of the prevalence rate of smart phone users by D2C Inc.
http://www.d2c.co.jp/en/news/2012/20120418-1336.html
※2. Codiqa
http://www.codiqa.com/
※3. jQuery Mobile
http://jquerymobile.com/

Recommended Book ! 〈NO.7〉

“Written in Stone”

Brian Switek, translated by Kyoko Nonaka (Bungei Shunju, 2011)

This book was written by a young American paleontologist under the original title, “Written in Stone,” which is a rather modest title than its Japanese counterpart. It is well known that Darwin was bewildered by the inability to find fossils of the intermediate phase of evolution, *i.e.*, transitional fossils. However, this book describes the multiple discoveries of transitional animal fossils within the last 20 to 30 years. The author raises evolutionary issues that range from fish to terrestrial quadrupeds, reptiles to birds, ancestors of mammals and land-dwelling whales, and elephants, horses, and apes to humans. In this book, many previously unknown facts, except to specialists, are introduced with ample fossil samples.

A common characteristic of biological evolutions is that evolution is non-linear and involves many widespread branches, which are trimmed by the extinction of a species. In other words, evolution is similar to a tree with intricate branches of generation and extinction. To illustrate this point, many types of feathered dinosaurs have diffusely emerged prior to the evolution of birds, for example, the archaeopteryx is not an intermediate step in the evolution of birds but a fossil species that became extinct. Many such examples clearly indicate that the so-called “orthogenic evolution” is not entirely accurate. In addition, these examples may consequently provide an answer to “Gould’ s Problem,” which questions whether the evolutionary process of the dawn of humanity may be reproduced if the history of evolution is rewound. (K.N.)

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Editor's Note

A topic related to the “definition of weeds” originated at a plant researchers gathering. The professional weed scientist, Dr. Miura, was then asked to contribute to this newsletter issue. As expected, there was a lot to learn about weeds. Interestingly, edible weeds are called “volunteer” as opposed to “feral” weeds. We sincerely appreciate Dr. Miura for his contribution to this newsletter during his busy schedule. Finally, let us be aware of heatstroke during this intensely hot summer and enjoy supporting the Olympic games! (Y.Y.)

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