Preface

During the most time of my life, I had researched the object on the domestication process and dispersal roots of grain crops, especially millets, Gramineae. The objectives which I research the plants in Quaternary, are the four as follows. The first is understanding how our human being have expanded the relationship between them and the plants in their evolution process. The second is considering the historical process on constructing agricultural civilization, from the steps of pre-farming using fire, farming/ horticulture, via one of wild animals. The third is considering the future agricultural technology applied bio-science, information technology comparing the present agriculture. The fourth is integrating basic botany, subsistence, agriculture as ethnobotany of millets.

Why do we study millets as orphan crops today? These are also called neglected and underutilized species. However, Dr. Swaminathan (2022) questioned again whether the naming is a correct view. Indian people had celebrated the special year of millets in 2018. Indian Government had proposed the International Year of Millets to Food and Agriculture Organization. The year was scheduled for 2026. However, it was changed to 2023, because the United Nation had been decided that the period was held during UN Decade of Action on Nutrition (2016~2025), UN Decade of Family Farming (2019~2028) and additionally UN Declaration on the Peasants (2018).

Nowadays, not only millets but also various landraces of domesticated plants were disappeared. People has forgotten the traditional knowledge system on subsistence and then lost their biocultural diversity. I will propose that we transit to the civilization for all organisms, in order to evaluate again and continue these basic culture complex including the subsistence created in Jomon period, upland farming and paddy field in Japan,

In the present Anthropocene, Quaternary, the population of human being is over 8 billion, and then our food sovereignty/security are urgent issue under the climate change. Because the yields of major grains have reached to the upper limit, we must avoid the crisis consequently by growing various grains and ensure the total yield of grains.

My graduation thesis (1972) was “Anther culture of Triticeae,” master’s thesis (1974) was “Tillering of *Zea mays*,” and Docter’s thesis (1980) was “Evolution from perennials to annuals in weeds.” I have proceeded field survey of millets in parallel. I have visited many farmers in Kanto Mountain area. Therefore, my research methods have started from physiology, ecological genetics to multivariate analysis of morphological characteristics on the farm field and greenhouse, to quantitative analysis of their biological components.

Moreover, I had visited many farmers and fields in all Japan, Indian subcontinent, Central Asia and so on in order to get local seeds of grains, their information about cultivating, processing,

and cooking methods, then analysis statistically. I tried namely to integrate all research data which was ethnology, cultural anthropology, archeology, linguistics based on botany of weeds, millets including rice, wheat, legumes, and tubers. For this research project, I had supported by many researchers, but I did all research action by myself until my retirement.

I have written five books self-selected more 10 years after my retirement. I used my research data collected for over 50 years, integrated them, and then considered the domestication process and dispersal routs. This is a methodology from scientific analysis to integrated environmental studies. In this integrated methodology, I have been able to understand gradually from gathering wild grains, pre-farming, semi-domestication, to domestication process (botanical origin) and dispersal route (geographical resource). Moreover, I keep in mind that I have progressed the ethnobotany to the integrated domain including the origins of agriculture and city states, ethnic food culture, comparison among agricultural words. However, there is a limit, because the research technology has been progressed and many papers are published.

This special issue is composed of studies on the agricultural complex, domestication process, and dispersal of millets, especially *Setaria pumila* (syn. *Setaria glauca*) and *Panicum miliaceum* and not major crops such as rice, wheat, barely, and maize, in the Indian subcontinent. *Setria pumila* has been dispersed in only a very limited area of the Deccan Plateau (Kimata 2015a, 2015b), while *Panicum miliaceum* has been dispersed throughout Eurasia (Kimata 2015d), including the Indian subcontinent, and recently North America and Australia. It is very fascinating from an environmental perspective of history and geography that the distribution patterns of *Setaria pumila* and *Panicum miliaceum* are remarkably different.

Only 50 years in my researcher life, I have met so many masters and friends. As the result, I have been able to expand my research contents. Also, I have seen many beautiful nature and kind people. As a botanist, I am very happy around beautiful flowers in my life.