

PREFACE

Loaches of the genus *Cobitis* Linnaeus, 1758 and related genera are widely distributed primary freshwater fish group of the Palearctic region. Their distribution covers almost the entire temperate Eurasia, including some peripheral areas in the northern Africa, England, Japan, Sakhalin and Indochina.

Many species of *Cobitis* and related loaches are small bottom-dwellers externally resembling each other by body shape and coloration patterns. Many European and Asian ichthyologists have been attracted by these small fishes, but their wide geographic ranges and extensive morphological similarities made it difficult for them to carry out classification studies to reach a stable taxonomy and systematics. Because of separation by geographical distances, languages, and/or social/political systems, it had been difficult for most of the ichthyologists to carry out comparative studies on wide range of species and/or populations until recently. A few excellent ichthyologists, however, made their efforts to solve the problems of speciation in spiny loaches as early as 1940s (for example, see introductory note on Sumio Minamori's works in this issue), but invisible barriers prevented ichthyologists from sharing their modern ideas.

In this International Conference "Loaches of the Genus *Cobitis* and Related Genera", which took place in Brno, more than 40 contributions were presented on various aspects of loach biology. We are happy to say that this was the first opportunity for ichthyologists interested in loaches, "cobitophiles", from many countries, almost covering whole geographic range of *Cobitis* and related loaches to exchange ideas. Many of the contributions focus on morphology, ecology, genetics, hybrid complexes, phylogeny and distribution of loaches. These contributions provide some basic information for understanding the biology and biodiversity of cobitine species.

Loaches of the subfamily Cobitinae, namely genera *Cobitis*, *Misgurnus* and *Iksookimia* include polyploids with both bisexual and unisexual (i.e. altered mode of) reproduction systems to an extent not known among other teleostean fish. Polyploid loaches *Misgurnus* were first discovered independently from Far East (Japan) and Europe (Rumania) from late 1960s to early 1970s. In the mid 1970s, the first diploid-polyploid complexes were found in spiny loaches (*Cobitis*) in Japan and Bosnia. The coexistence of diploid and tetraploid forms together with an apparent lack of triploids in Japan made it difficult for Japanese ichthyologists to provide deeper mechanistic discussions on the origin of the tetraploid forms. The first complex discovered in Europe (Bosnia) includes diploid and triploid forms, but it was not investigated further. Unfortunately however, invisible barriers again made it difficult for ichthyologists to make further progress at that time.

Since the early 1980s, the situation has gradually changed. The finding of diploid-polyploid hybrid complexes, including forms with uni- and bisexual mode of reproduction, in Russia by a research group involving a contributor to this issue provided at the first time deeper insight into the mechanisms of speciation in loaches associated with polyploidy and unisexual mode of reproduction. Several similar diploid-polyploid hybrid complexes were then discovered independently in Korea, Poland, and the Czech Republic by several other contributors to this issue. These contributions enabled us to speculate on the relationship between hybridization, modes of reproduction and polyploidization. Several recent experimental studies, including genome manipulation were carried out by other contributors to this issue in order to elucidate the mechanism of polyploid speciation. It is now evident that loaches of the genus *Cobitis*, *Misgurnus* and *Iksookimia* are the best natural models to study of evolution of polyploidy associated with the origin and mechanisms of unisexual reproduction. In this issue, readers can access much of the most up-to-date research on *Cobitis* and related loaches.

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