

## Genetic Differentiation and Reproductive Isolating Mechanisms of Korean Vertebrate Species

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The purpose of this presentation is to review the literature of genetic differentiation and reproductive isolating mechanisms between Korean vertebrate species based on conventional electrophoretic analyses of proteins performed in Korea for last two decades. It seems appropriate to review at this time because with the advent of new techniques for gene isolation, cloning, and nucleotide sequence determination etc., the era in which protein electrophoresis is rapidly coming to an end. Thus it is worth to take stock of all studies done in Korea, both for interest in results and as a stimulus for further detailed study. Nonetheless it should be emphasized that because protein electrophoresis is relatively simple and inexpensive, it will continue to be a valuable approach for many projects such as discriminating cryptic species, natural hybridization analysis, and so forth.

Many proteins from different organisms can be readily compared by means of gel electrophoresis. Although not all amino acid differences are detected by this method, it provides reasonably satisfactory estimates of the relative degree of genetic differentiation between closely related species. For each genus, means of genetic distance(D) across all pairs of assayed vertebrate species in Korea since 1977 were calculated. There is clearly a wide range of difference in mean level of D across genera. Avian genera exhibit very small distances, whereas mean D between species in the amphibian genera are huge. The range of distances observed within a given genus is also typically very large. It seems safe to conclude that genera and families in the different classes of vertebrates are not equivalent in level of structural gene divergence as currently assayed and probable causes are discussed. The results of electrophoretic studies lead to general statement that there may not be a strict correlation between degree of genetic differentiation and degree of difference at the organismal level. This point may be illustrated by the results of comparing genetic distance from the *Zacco* species with those of the *Opsariichthys bidens*. According to most ichthyologist, the *Z. Platypus* is more similar in morphology and way of life to *Z. temmincki* than is the *Opsariichthys bidens*. At the protein level, however, the similarities among three species contrast with the organismal similarities noted above.

Reproductive isolating mechanisms may be an incidental by-product of genetic divergence between separated populations. When previously separated taxa (populations) come into geographic contact, hybridization between them may then take place, depending on the strength of the pre-existing reproductive isolating mechanisms, and of the extent hybridization, the two taxa may fuse into a single gene pool or may develop complete isolating mechanisms by natural selection. An example of isolating mechanism analysis may be presented here with a pair of incipient species of *Moroco lagowskii* and *M. oxycephalus* at sympatry.