

CRYPTIC VARIATION AND ITS MANIFESTATION IN THE LOWER TRENTONIAN
RAFINESQUINA LINEAGE (Ordovician, New York State).

TITUS*, Robert, Dept. of Geology, Hartwick College, Oneonta, NY 13820

Species populations commonly carry a great deal of genetic variation which is not expressed in individual phenotypes. Cryptic variation can be carried in recessive alleles, in cases of heterosis, or where modifier genes inhibit expression of the hidden trait. Other genetic and ecological factors also allow cryptic variation. Stabilizing selection prevents the expression of hidden traits; normalizing selection weeds out the deviants and canalizing selection suppresses their traits. Together the two keep the species near the top of the adaptive peak. Cryptic variation balances a species' need to be well-adapted to its environment and also for it to maintain a reserve of variation for potential environmental change. Expression of cryptic traits is rare and is usually associated with times of greatly reduced natural selection and rapid population growth, when the lower slopes of the adaptive peak are exposed.

A possible example of the manifestation of cryptic traits occurs within the lower Trentonian Rafinesquina lineage of New York State. The two most commonly reported species of the genus have been reappraised in terms of cryptic variation. Extensive collections of Rafinesquina "lennoxensis" reveal far more intergrading morphotypes than had hitherto been recognized. The form which Salmon (1942) described is broadly U-shaped with sulcate margins. It grades into very convex forms as well as sharply-defined or convexly geniculate types. Of great importance, all forms grade into the flat, U-shaped, alate R. trentonensis, which is, by far, the most common and widespread lower Trentonian member of the genus. The R. "lennoxensis" assemblage has a very narrow biostratigraphy, being confined to a few locations in the upper Napanee Limestone. This places it in a quiet, protected, low stress, lagoonal setting behind the barrier shoal facies of the Kings Falls Limestone.

The R. "lennoxensis" assemblage does not constitute a natural biologic species; it is reinterpreted as an assemblage of phenodeviants occupying a low stress, low natural selection lagoon facies. All such forms should be included within R. trentonensis. Given the evolutionary plasticity of this genus, extensive cryptic variation is not surprising.