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Reprinted from *THE NAUTILUS*, Vol. 65, No. 4, April, 1952  
Printed in U. S. A.

## INFRA-SUBSPECIFIC TERMINOLOGY IN MARINE MOLLUSKS<sup>1</sup>

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The problem concerning the proper use and meaning of trinominal<sup>2</sup> names has confronted systematic zoologists and paleontologists since the adoption of the international rules of zoological nomenclature. Originally no provision was provided for taxonomic units lower than the species level with the exception of subspecies. Unfortunately, subspecies were not defined but were made co-ordinate in the rules with species (Articles 11, 12). This led to the utilization of a number of trinominal terms of diverse meaning and application. The lack of standardization is generally lamentable in all of the varied fields of systematic zoology and has become all too prevalent within many of the specialized branches.

Many taxonomists thus welcomed the proposed remedies as outlined by the Secretary of the International Commission on zoological nomenclature.<sup>3</sup> These changes in the rules require a trinominal name published prior to 1951 to be considered a

<sup>1</sup> Contribution no. 67 of the Allan Hancock Foundation, The University of Southern California.

<sup>2</sup> Subgeneric names are not considered in the determination of the number of taxonomic units comprising a species.

<sup>3</sup> Francis Hemming, *The Bulletin of Zoological Nomenclature*, vol. 3, pts. 1/3, pp. 55-62; pts. 4/6, pp. 63-68, London, 1950.

subspecies unless the original author definitely indicates that he regards the unit to be of infra-subspecific rank. After 1950, i.e., January 1, 1951, the procedure is changed so that the original author must indicate that a proposed unit is a subspecies and units not so designated are to be considered as infra-subspecific in rank. Inasmuch as infra-subspecific units are not governed by the laws of priority and homonymy, the same name is available to indicate similar features of form in the species comprising a single genus, several genera, etc., e.g., the descriptive name *major* could be utilized to indicate forms which are gigantic monstrosities of the species contained in a single genus, or all the genera comprising a family, etc. In cases where subsequent revisers raise infra-subspecific units to the status of subspecific or specific rank, the promoted unit can be given a new name or the original infra-subspecific name may be retained. In either procedure, the reviser's name is attributed to the new unit and priority commences at the date of the transfer. When the original infra-subspecific name is transferred particular caution must be exercised in assuring that the newly promoted unit name is not a homonym.

The trinomial units can be divided into two major categories namely, subspecies and infra-subspecific forms. A taxonomic subspecies is here accepted as being a geographically or reproductively isolated race or population of a polytypic species.<sup>4</sup> Infra-subspecific representatives of a species on the other hand, are considered to be units based on variations occurring in individuals or groups, and not necessarily confined to a single population. The infra-subspecific units can be subdivided into a number of categories, the most significant being genetic potentials of populations, e.g., color phases, increase in the number of whorls, etc., and ecological variations influenced primarily by environmental conditions which are evidenced by physiological responses, e.g., thickness of shell, extent of development of external ornamentation, etc.

While the application of the revisions of the rules may be more difficult in some fields than in others, these provisions seem to be especially applicable to the Recent marine mollusks (par-

<sup>4</sup> See Ernst Mayr, *Systematics and the Origin of Species*, pp. xiv, 334, New York, 1942.

ticularly for intertidal species). Trinominal assignments of proposed units require careful consideration. For example, in a recent issue of THE NAUTILUS the following citation appears, "*Urosalpinx cinereus* Say, var. *follyensis*, new form<sup>1</sup> [footnote] <sup>1</sup>Nomenclatural subspecies." Does the author propose this new trinominal unit to be a variety, form, or subspecies? Under the revised rules this confusing usage must be interpreted to be the proposal of a new subspecies even though the author apparently intended only to indicate the presence of an infra-sub-specific form.\*

While the differentiation between genetic forms and ecological varieties of infra-subspecific units is often extremely difficult, the writer believes that the distinction should be made when possible. For example, some gastropods which have a wide ecological tolerance produce a thickened shell lacking or reduced in development of spines when living in wave shock areas on an open coast, while representatives of the same species occurring in protected areas tend to have a thinner, larger shell with more spinose ornamentation, e.g., *Thais (Nucella) lamellosa, sensu lato*. A number of these ecological varieties have been given "subspecific" names. On the other hand, varietal and "subspecific" names have been proposed for genetic constituents of populations of the same species because of the possession of a color character not possessed by the "type," e.g., *Tegula gallina tinctoria*. It thus seems advisable to distinguish between these two basic infra-subspecific categories.

While a number of terms have been proposed to define minority elements of a rank below the subspecific level, the purpose of this paper is not to elaborate upon them. Since standardization is definitely needed, lest complete nomenclatural chaos result from the recent changes in the rules. I here recommend that infra-subspecific units of apparent genetic origin be indicated by using the word form,<sup>5</sup> e.g., "*Polinices (Neverita)*

\* Systematics (science) and nomenclature (legal rules) should be kept in separate compartments of one's mind. If a new trivial term be worthy of publication, it should be given the same nomenclatorial status as a species, as was done for this (apparently ecologic) form.—H. B. B.

<sup>5</sup> The utilization of the Latin equivalents of these, *forma* and *variatio* respectively, would necessitate the use of the feminine gender for the descriptive terms.

*reclusiana* Deshayes, 1841, form *imperforata* Dall, 1909," and for units of apparent primary ecological influence the word variety<sup>5</sup> be used, e.g., "*Ostrea lurida* Carpenter, 1864, variety *expansa* Carpenter, 1864." In both usages, the definite assignment of the proposed trinominal name to an infra-subspecific status should be made, preferably in the body of the text or at least as a footnote to the new minority unit.

While it is not my intention of advocating the indiscriminate use of infra-subspecific names, the above recommendations are proposed in an effort to obtain a stabilized terminology for taxonomic units of this rank.