

In Rosewater's (1970) systematic revision, *L. undulata* (Gray, 1839) and *L. coccinea* (Gmelin, 1791) are considered as closely related species. Both are placed by Reid (1986) in genus (formerly sub-genus) *Littoraria*. We were allowed to study a lot of samples from two South-Pacific islands. *L.u.* was collected in Laing Island, a coral bank off the North-East coast of Papua-New Guinea (Claereboudt *et alii*, 1990) while *L.c.* comes from the shores of Oponohu Bay (Mo'orea, Society Islands). The results of this study may be summarized in the following points :

- a) *sex-ratio*. In Littorinids, females are often in excess (Sacchi, 1984). However in both *L.u.* and *L.c.* the excess is particularly important.
- b) *sex dimorphism in shells*. Both *Littoraria* confirm the general trend in Littorinids -not always statistically significant- toward larger and more globose shells in females.
- c) *size variations and habitat*. *L.u.* from habitats more exposed to waves shows smaller sizes. In Oponohu Bay *L.c.* local relations between size and habitat variations may also be found.
- d) *colour polymorphism in L.u.*. Colour morphs were classed into three groups. Mottleds are always prevailing. No significant difference was found according to sex or habitat in Laing Island.
- e) *trophic spectra*. The gut content of both species, analyzed by the usual methods (Voltolina & Sacchi, 1990) revealed microphagous traits, related to the typical situations of these *Littoraria* in macroscopically "bare" substrata (coral and basalt rocks ; roots and logs) in the intertidal zone.

Data are added concerning mollusc species found with *L.u.* and *L.c.* at the same levels : they are mainly other *Littoraria*, of the *L. scabra* (L.) group, and a few species of *Nerita*, s.l.

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## Variations in uric acid concentration and xanthine dehydrogenase activity in *Littorina saxatilis* (Olivi) and *Littorina arcana* (Hannaford Ellis)

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The nature of the end-products of nitrogen metabolism has long been recognized to be a function of the toxicity of ammonia and the water available for its excretion, aquatic species

in general being ammoniotelic and terrestrial species ureotelic or uricotelic. (Delaunay, 1931, Needham, 1935). However, apparently all gastropods accumulate uric acid to some degree (Duerr, 1967). Uric acid may be retained for long periods before being voided, or may even be retained indefinitely in a kidney of accumulation (Potts, 1967, Wilbur, 1983).

The position of littoral molluscs with regard to nitrogen excretion may be thought of as intermediate between land and aquatic snails ; prosobranch species that live high in the intertidal zone contain more uric acid than those species from lower down (Potts, 1967, Needham, 1938). However, I am not aware of previous studies *within* species of uric acid variation related to position on the shore.

*Littorina saxatilis* and *L. arcana* collected from a boulder field low in the intertidal zone had a uric acid concentration significantly higher than snails collected from nearby cliff crevices that were at the upper limit of their range. Xanthine dehydrogenase activity also differed between animals from the two sites in the same manner as did the uric acid concentration, indicating that the higher levels of uric acid are not due merely to accumulation, but also at least in part to increased synthesis. The absolute concentrations of uric acid varied with different collections, suggesting a possible seasonal fluctuation in uric acid. *L. arcana* had a greater concentration of uric acid than *L. saxatilis* when both were from the boulder field, but the two did not differ significantly when taken from crevices.

Samples from the two sites were marked and translocated ; by four weeks the translocated animals showed a tendency to develop a uric acid concentration similar to that of natives of the site, indicating a physiological adjustment rather than a genetic adaptation. Although the crevice-dwelling animals are higher in the intertidal zone, it is suggested that they are in fact less subject to dessication and that the higher uric acid concentration of boulder field snails reflects a water conservation mechanism that is not required in the crevices.

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## TBT concentrations in coastal waters determined by the degree of imposex in different prosobranch species

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Tributyltin (TBT) is a very effective biocide in various formulations (Hall & Pinkney, 1985). Especially its use in marine antifouling paints has an adverse impact on nontarget organisms and led to a ban of TBT based paints in several countries (Huggett *et al.*, 1992). Because the analysis of organotin compounds in water and tissue is rather time consumptive and expensive there is an urgent demand for a more simple but reliable method to