

relationship" (she retained *Pterynotus* in the Muricinae). "There is also a strong resemblance to the more alate members of the *Ceratostoma* group such as *Murex foliatus*, but *Pteropurpura* may be distinguished by the lack of the monoceroid tooth and denticulate aperture characteristic of *Ceratostoma*".

Fleming (1962: 110) included the large, weakly sculptured, tri-varicate New Zealand Tertiary species of the "*Pterynotus*" *laetificus* lineage in *Pterynotus sensu stricto*, noting their resemblance to species included in *Pteropurpura*, but also noting that the type species of *Pterynotus*, *Murex pinnatus* Swainson, 1822, is an aberrant species. The members of the *laetificus* group have weakly dentate outer lips, lack the large monoceroid tooth of *Ceratostoma*, and resemble foreign species of *Pteropurpura* closely in shape, in their weak spiral sculpture, in their three thin, broadly expanded varices united up the shell so that it has a triangular cross-section, in lacking a posterior canal in the outer lip, and in having one or a few relatively small nodules between varices. Thus they seem referable to *Pteropurpura* rather than to *Pterynotus*, which was (correctly, in the writer's opinion) used by Vokes (1964: pl. 2, p. 37) for such species as *Murex elongatus* Lightfoot (= *Murex clavus* Kiener). Some of the specimens of *Pteropurpura macroptera* (Deshayes) figured by Emerson (1964) are extremely similar to New Zealand specimens of *Pteropurpura laetifica*.

*Pteropurpura* seems to be widespread in the Tertiary rocks of the world. All the species listed by Fleming (1962: 112) as members of *Pterynotus* s.str. are members of *Pteropurpura*, and many others occur in the early and middle Tertiary of Europe and the middle and late Tertiary of North America. The genus now lives in Japan, in Australia (and probably in the western Pacific archipelagoes between these extremes), in New Zealand, in central and northern western America, and in the western Atlantic.

Of the Australian Tertiary Muricidae described by Tate (1888), *Murex* (*Pterynotus*) *velificus* (Tate, 1888: 95, pl. 1, fig. 8) and *Murex* (*Pterynotus*) *calvus* (Tate, 1888: pl. 1, fig. 11) can definitely be referred to *Pteropurpura*. Most of the other species referred to "*Pterynotus*" by Tate belong in *Pterochelus* Jousseau, but *Murex* (*Pterynotus*) *bifrons* (Tate, 1888: 97, pl. 1, fig. 12) has many irregularly placed varices and cannot be referred with certainty to any of the established genera on the basis of Tate's figure. Finlay (1930: 77) and Fleming (1962: 112) noted that *Murex calvus* Tate, 1888, was the Australian Tertiary species most closely related to *P. laetifica*; however, the Recent Australian *Pteropurpura bednalli* (Brazier) is very much more similar to *P. laetifica* than is *P. calva*, and may be phylogenetically related. The similarity is discussed further under *P. laetifica laetifica*.

#### *Pteropurpura laetifica* (Finlay, 1930)

New Zealand Cenozoic and Recent members of *Pteropurpura* fall into two species; *P. kauparaensis* (Fleming), discussed below, is a distinct species that may not have evolved directly from the lineage of *P. laetifica*. All other Upper Eocene to Recent *Pteropurpura* from New Zealand are here referred to three subspecies of *P. laetifica* (Finlay).

*Pteropurpura laetifica laetifica* (Finlay, 1930). Pl. 1, Figs. 1-3, 5, 8; Pl. 2, Figs. 13-15, 18.

1930. *Pteronotus* (s.str.) *laetificus* Finlay, Trans. N.Z. Inst. 61: 76.

1931. *Pteronotus* n.sp. Marwick, Paleont. Bull. N.Z. geol. Surv. 13: 118, pl. 12, fig. 226.

1962. *Pterynotus* (s.str.) *laetificus*: Fleming, Trans. R. Soc. N.Z. zool. 2(14): 111, pl. 1, figs. 2-8.

Topotypes or near-topotypes of *Pteropurpura laetifica*, from the type locality of the Waiauan Stage (late Middle Miocene), the Nissen shellbeds at Park Bluff, Clifden (see Fleming, Chapter 4, in Wood, 1969), are very rare. Fleming (1962: