

Trechine beetles of the genus *Duvaliomimus* are not all restricted to caves. *D. watti* Britton inhabits deep bush streambeds in the Hunua Range near Auckland, and two bush species, *D. brittoni* Jeannel and *D. walkeri* (Broun) are found in the South Island. *D. styx* from Puriri Cave, Port Waikato, may be a very recent cavernicole. A catastrophic climatic change took place for these shade-loving beetles, when bush was cleared for farming about 100 years ago. Individuals living in the vicinity of the cave, which doubtless they were already in the habit of visiting, would have sought permanent shelter there, becoming virtually isolated by the unwelcome glare and dryness beyond the entrance. The species has normal eyes and does not yet show signs of regression. *D. mayae* is the most numerous troglobic species inhabiting the Te Kuiti-Piopio caves. It has undergone considerable modification but still possesses eyes, though these are greatly reduced. *Neanops caecus*, known only from Fred Cave, is completely anophthalmous and weakly pigmented, but its appendages are not elongated to the same extent as in *D. mayae*. It has the facies of an edaphobite.

Jeannel's (1959) remarks on the cave fauna of New Zealand would appear to be somewhat premature considering the paucity of collection and of published work in the past. Present indications are that the Coleoptera, particularly of South Island Caves, are not only fairly numerous, but are proving to be of interest phyletically. The number of forms is likely to be limited by the relatively small extent of cave areas, compared with those of Europe and N. America, rather than by climatic considerations.

Chronology

The Te Kuiti limestone was laid down in the Oligocene (Waitakian) (Finlay and Marwick 1940) 25 to 40 million years ago, finally emerging from the sea during the Miocene (Fleming 1949). Cave excavation would have begun perhaps 13 million years ago, in the Pliocene or even earlier (upper Miocene). The evolution of some cave forms could have started then, the insect fauna being closely similar to that of Recent times (Tillyard 1926). Beetles preferring a cool, moist habitat are more likely to have resorted to caves during the first interglacial stage of the lower Pleistocene, nearly 2 million years ago.

Affinities

"The similarities between the cave faunae of widely separated regions are attributed to the fact that only members of certain groups are able to adapt themselves to cave conditions, and that such adaptation produces parallel structure and appearance." (Hesse *et al loc. cit.*).

Peripatoides is a troglaxene in New Zealand, but a troglobic Onychophoran genus, the only one known, is described from South Africa. This is *Peripatopsis alba* Lawrence 1931, which is depigmented, anophthalmous and bears relatively long, slender legs.

Isopoda (terrestrial). The genus *Styloniscus* Dana is extremely close to *Cordioniscus* Graeve of which a troglobic species is recorded from Greece (Vandel 1958b).

Amphipoda (aquatic). A group which in Europe and N. America is well represented by numerous species in the family Gammaridae, is as yet represented in New Zealand caves by two genera only, in the same family.

Collembola. Of the ten species collected, three are new to science (Salmon 1958) and may be regarded as troglobic. The extent to which they are in fact obligatory cavernicoles can only be determined by further study, such as evaluation of cave dependent characteristics as indicated by Christiansen (1961). All the genera occurring here are also recorded from American or European caves (Strinati 1953; Deboutteville 1952; Cullingford 1953; Christiansen 1960).