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(The pages of the publication follow this cover sheet)

Aquatic Insects of Little Barrier Island

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In November, 1954, a collection of aquatic insects was made on Little Barrier Island. This island lies at the entrance to the Hauraki Gulf, 14 miles from the mainland. The island, which is approximately 7,000 acres in area, is more or less circular and has a central mountain group with a consequent radiating topography. It is a sanctuary and is covered with native forest.

The aquatic fauna of the island is of a restricted type, as the streams are ephemeral. Watersheds are steep and the run-off is rapid. Hamilton (1935) stated, "Except after heavy rains, many of the streams carry little or no run of water during the drier seasons of the year." None of the streams investigated was flowing; pools and stream beds yielded the specimens recorded below.

Collecting was confined to the south-western sector of the island. The Te Wairere stream bed was the most western investigated and there nymphs of *Ameletopsis perscitus* (Eaton) and *Atalophlebia dentata* (Eaton) were found amongst damp fine gravel and vegetable debris under stones as well as in pools. In the Ngamanauraru stream bed, hanging above Ngamanauraru Bay, only one pool was examined. Waipawa, Turner's (opening out on to Marae Roa), Te Waikohare, and Awaroa stream beds were also investigated. In the last-named a larva of *Archichauliodes diversus* (Walker) was seen amongst stones in the dry bed. Specimens taken at light were collected on the "the flat" (Marae Roa).

In addition to specimens collected on this expedition a specimen in the Auckland War Memorial Museum collection is included in these records. Some duplicates from the material collected are lodged in the Museum collection, the rest are in the Plant Diseases Division collection. Unless otherwise stated, all specimens were collected by the author.

PLECOPTERA

Family Gripopterygidae

Nesoperla trivacuata Tillyard

1923—*Nesoperla trivacuata* Tillyard, *Trans. N.Z. Inst., 54* : 211.

1 ♀. Running on stone in rain, Awaroa Stream bed, 25/11/1954.

EPHEMEROPTERA

Family Siphlonuridae

Ameletopsis perscitus (Eaton)

1899—*Ameletus perscitus* Eaton, *Trans. Ent. Soc. Lond., 47* : 291.

2 Nymphs. ex pools, Te Wairere Stream bed, 24/11/1954.

Family Leptophlebiidae

Atalophlebia dentata (Eaton)

1871—*Leptophlebia dentata* Eaton, *Trans. Ent. Soc. Lond., 19*: 80, Pl. 4, fig. 18.

1 Imago. ex Tirikakawa Stream bed, 20/11/1947 (J. Dingley). (Auckland Museum collection).

1 Imago. On surface of pool, Te Wairere Stream bed, 24/11/1954.

11 Nymphs. ex pools, Te Wairere Stream bed, 24/11/1954 (5, Auckland Museum collection).

1 Nymph. ex pool, Waipawa Stream bed, 28/11/1954.

ODONATA

Anisoptera

Family Corduliidae

Procordulia smithii (White)

1845—*Cordulia smithii* White, *Zool. Erebus and Terror, Insects,* Pl. 6, fig. 2.

1 Nymph. ex pool, Te Wairere Stream bed, 24/11/1954.

This nymph fits the description of *Procordulia smithii* by Hudson (1904) but it could possibly be *Somatochlora braueri* (de Selys) the nymph of which is as yet undescribed.

Zygoptera

Family Coenagriidae

Xanthocnemis zealandica (McLachlan)

1873—*Telebasis zealandica* McLachlan, *Ann. Mag. Nat. Hist. (4), 12* : 35.

1 ♂, 1 ♀. Flying above pool, Turner's Stream bed, 29/11/1954.

Eggs in leaf tissue. ex pool, Turner's Stream bed, 29/11/1954 (3, Auckland Museum collection).

The egg has not previously been described. A description is given below.

Length: .84 mm. Width: .18 mm. Elongate-oval, pedicel pointed. Cream (in alcohol), pedicel brown. Chorion thin, colourless.

Eggs were inserted, at random, into the soft tissues of half-rotten plant debris just below the surface of the water.

HEMIPTERA

Heteroptera

Family Veliidae

Sub-family Microveliinae

Microvelia sp.

1 apterous ♀ ; 7 Nymphs. On surface of pool, Te Wairere Stream bed, 24/11/1954.

1 apterous ♂ ; 1 apterous ♀ ; 2 Nymphs. On surface of pool, Ngamanauraru Stream bed, 24/11/1954.

Dr. T. E. Woodward has advised that these specimens are not *Microvelia halei* Esaki but probably *M. macgregori* Kirkaldy, although they differ somewhat from the description of that species.

NEUROPTERA

Megaloptera

Family Corydalidae

Sub-family Chauliodinae

Archichauliodes diversus (Walker)

1853—*Hermes diversus* Walker, *List Specimens, Neur. Ins. Brit. Mus., 2*: 206.

1 Pupa. Under stone, Awaroa Stream bed, 25/11/1954 (J. T. Salmon).

TRICHOPTERA

Inaequipalpia

Family Sericostomatidae

Oeconesus maori McLachlan

1862—*Oeconesus maori* McLachlan, *Trans. Ent. Soc. Lond. (3), 1* : 303.

1 ♀. ex Awaroa Stream bed, 28/11/1954.

Olinga feredayi (McLachlan)

1868—*Olinx feredayi* McLachlan, *Journ. Linn. Soc. Lond. Zool., 10* : 198.

1 Pupa in case, 2 Larvae in cases. ex pool, Te Wairere Stream bed, 24/11/1954.

The larval case is figured in Plate 50.

Helicopsyche sp.

1 Larva in case. ex pool, Te Wairere Stream bed, 24/11/1954.

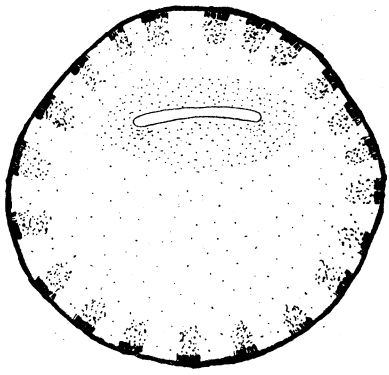
The helicoid case is figured in Plate 50.

? Pycnocentria sp.

1 Larval case. ex pool, Waipawa Stream bed, 28/11/1954.

This case (Plate 50) is similar to that of *Pycnocentria evecta* McLachlan described and figured by Hudson (1904). Probably belongs to a species of *Pycnocentria* or an allied genus. Family determination was made from larval and pupal skins which it contained.

The case is 6 mm. in length, formed of sand grains on a horny base. Slightly tapered and curved. The anterior sieve membrane (text-fig. 1) is 1 mm. in diameter. It is quite substantial, made entirely of a secretion, and shaped like a pill-box lid. The single opening is a slightly curved slit.



Text-figure 1. ? *Pycnocentria* sp. Anterior sieve membrane.

Aequipalpia

Family Philanisidae

Philanisus plebeius Walker

1852—*Philanisus plebeius* Walker, *List Specimens Neur. Ins. Brit. Mus., 1*: 116.

1 ♂. Swept ex boulder beach, 24/11/1954 (R. A. Harrison).

1 ♀. Swept ex boulder beach, 24/11/1954.

1 ♂. At light, 26/11/1954.

3 ♂ ♂, 1 ♀. At light, 27/11/1954 (2 ♂ ♂, 1 ♀, Auckland Museum collection).

Family Leptoceridae

Sub-family Triplectidinae

Triplectides obsoleta (McLachlan)

1862—*Pseudonema obsoleta* McLachlan, *Trans. Ent. Soc. Lond. (3), 1* : 305.

2 Larval cases. ex pool, Te Wairere Stream bed, 24/11/1954.

Each case (Plate 50) is a hollowed out piece of twig. One end of the tube is blocked by small stones.

Family Polycentropodidae

Polyplectropus sp.

1 ♂, 1 ♀. At light, 26/11/1954.

1 ♀. At light, 28/11/1954.

2 Larvae. ex pool, Waipawa Stream bed, 28/11/1954.

2 Larvae. On debris in pool, Turner's Stream bed, 29/11/1954.

1 Pupal case. ex pool, Te Wairere Stream bed, 24/11/1954.

1 Pupal case. ex pool, Waipawa Stream bed, 28/11/1954.

Adult specimens belong to an undescribed species of this genus, but, as specimens representing at least two undescribed species are known in other collections, description of a new species is deferred.

Larvae and imagines cannot definitely be assigned to the same species.

The pupal cases are made of small stones tied together loosely with silk (Plate 50).

Pupal cases have been associated with the larvae by means of cast larval skins remaining in the cases.

Family Philopotamidae

Hydrobiosella stenocerca Tillyard

1924—*Hydrobiosella stenocerca* Tillyard, *Trans. N.Z. Inst., 55* : 289.

1 ♀. On surface of pool, Te Wairere Stream bed, 24/11/1954.

DIPTERA

Nematocera

Family Culicidae

Sub-family Culicinae

Aëdes antipodeus (Edwards)

1920—*Ochlerotatus antipodeus* Edwards, *Bull. Ent. Res., 10* : 132.

1 ♀. Swept at bush margin, Te Titoki Point, 25/11/1954 (R. A. Harrison).

2 ♀♀. ex Waipawa Stream bed, 25/11/1954 (R. A. Harrison).

1 ♂. ex Waipawa Stream bed, 28/11/1954 (R. A. Harrison).

1 ♀. ex Turner's Stream bed, 29/11/1954 (R. A. Harrison).

Culex fatigans Wiedemann

1828—*Culex fatigans* Wiedemann, *Assereur. zweifl. Ins., 1* : 10.

1 Pupa; 3 Larvae. ex pool, Ngamanauraru Stream bed, 24/11/1954.

1 ♂; 16 Larvae. ex pool, Te Waikohare Stream bed, 26/11/1954.

Family Dixidae

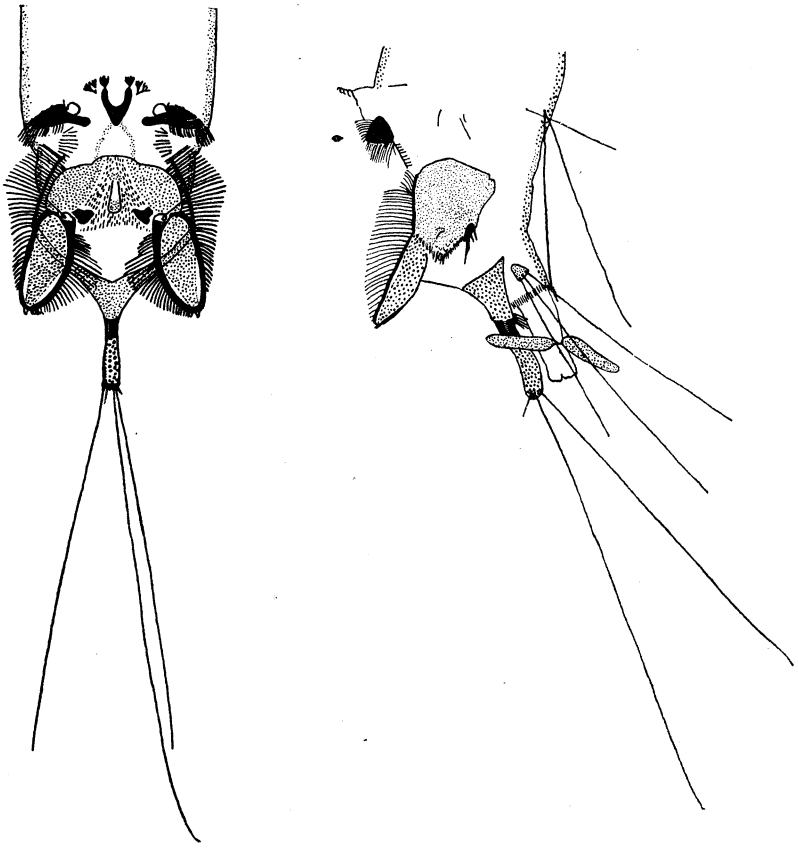
Dixa (Paradixa) sp.

1 Larva. ex pool, Te Wairere Stream bed, 24/11/1954.

Description of Larva

Length: 10 mm. Body colour (in alcohol) white with darker segmental patches on dorsum. Abdominal segments without dorsal crown of setae. Ambulacral combs on segments 5, 6, 7. Structure of end of abdomen as shown in text-figure 2. Gut somewhat extruded from anus. Sloping anterior wall of saucer-shaped spiracular depression bears small bifid chitinised plate. Lip of wall above plate bears two pairs of many branched setae, outer pair double-tufted. Caudal appendage pubescent;

long caudal setae inconspicuously plumose, two most dorsal and one of middle pair missing. Lobe of lateral plate with outer strongly chitinised opaque ring and inner transparent portion with light and dark areas, dark area filling basal half and narrowing distally. At peak of dark area a short tooth-like process arises from ventral surface of lobe and projects posteriorly. Side of lateral plate setose on posterior margin, postero-ventral angle bears three heavily chitinised teeth, one long and finely produced, two short and stubby.



A B

Text-figure 2. *Dixa (Paradixa)* sp. Larva.
End of abdomen, A. Dorsal B. Lateral.

This specimen belongs to the subgenus *Paradixa* which was erected by Tonnoir (1924) for two New Zealand species, *D. neozelandica* Tonn. and *D. fuscinervis* Tonn. Tonnoir described the larvae of both species. They can be separated by the form of the basal part of the lateral plates. Two teeth present at the postero-ventral angle in *D. neozelandica* are absent in *D. fuscinervis*. The larva from Little Barrier Island bears, at that point, three teeth, and there are other differences from Tonnoir's species in the structures at the end of the abdomen. It seems, therefore, that this larva represents a third, and as yet undescribed, species of the subgenus *Paradixa*.

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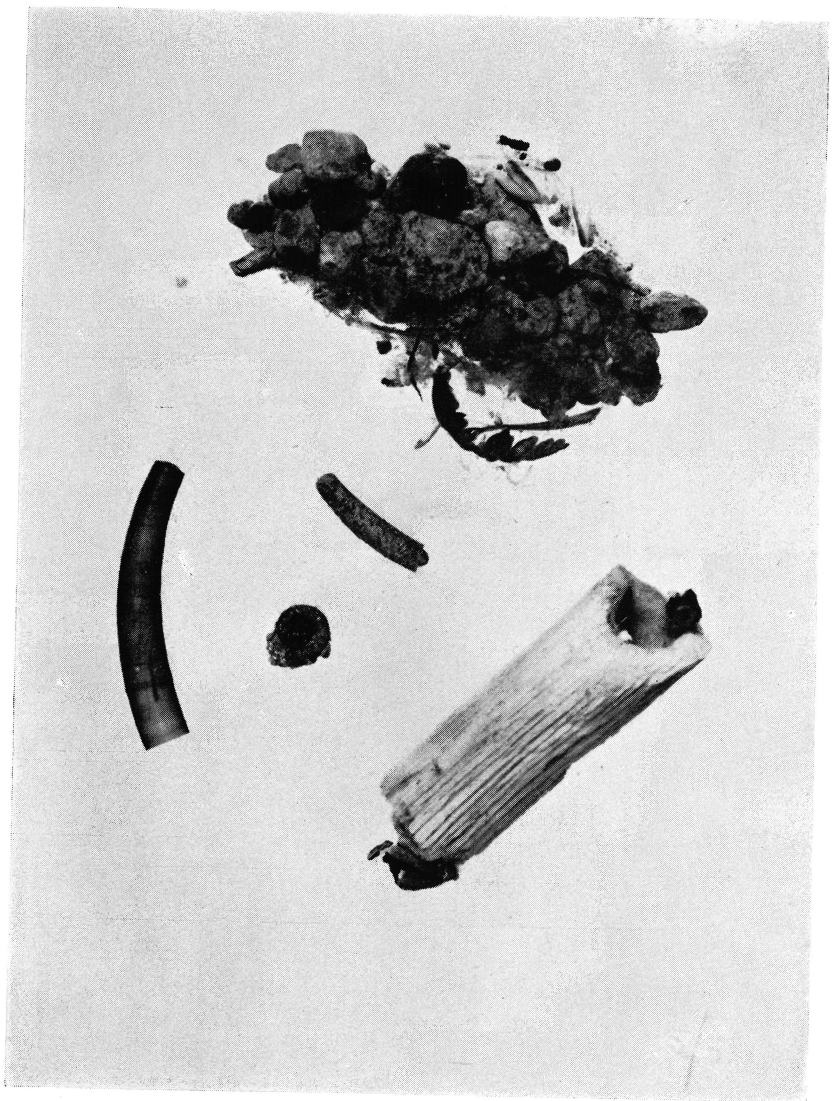

Caddis cases from Little Barrier Island.

Top: *Polyplectropus* sp. Pupal case.

Centre: ? *Pycnocentria* sp. Larval case.

Bottom left: *Olinga feredayi.* Larval case.

Bottom middle: *Helicopsyche* sp. Larval case.

Bottom right: *Triplectides obsoleta.* Larval case.