

the whole cycle of development can be related to seasonal temperature changes with some success (Young, 1965a). In neither species considered in the present paper can mature imagines switch from one morph to another.

In the present paper the changes occurring over a single year in populations in three habitats are examined. It describes the first year of what was to have been an intensive, long term study of the control and development of flight muscle polymorphism in the Notonectidae but pollution of the main study habitat at Kainga at the end of the first summer prevented this study from developing. The results are given here simply as an account of the changes observed with little attempt at interpretation. It is hoped that further suitable populations will develop to allow the work to continue in the future.

DESCRIPTION OF THE HABITATS

The populations studied were in three habitats, a pond and drainage channel at Kainga and the lagoon at Leithfield. The pond is the easternmost of a series of abandoned shingle pits lying close to the south bank of the Waimakariri River 10 miles north of Christchurch (NZMS 1, S76: 023697). It is L shaped with a length over the curve of 70 metres and an area of 3,000 square metres. There are shelving beaches extending to two or three metres in the south and east but elsewhere the bank plunges steeply to depths over five metres. Much of the bed and vegetation is covered by a thick layer of rusty silt which appears to have prevented extensive colonisation by corixids. The drainage channel runs out of the pond to the east. It has a uniform width of seven metres and is mostly between 30 and 50cm deep. Until cleared in December, 1964, it was almost choked with weed and debris.

The pond contained only one species of notonectid, *Anisops assimilis* White, and very low numbers of the corixid *Sigara arguta* (White). The channel held large numbers of *S. arguta*. Each habitat therefore contained essentially a single dominant species. This has advantages in easing identification of the earlier stages of the life cycle but has shortcomings in the loss of comparative information where responses to changing conditions might be expected to vary among different species.

Leithfield Lagoon is a long, narrow lagoon lying behind the sand dunes at Leithfield, 27 miles north of Christchurch (NZMS 1, S68: 115953). Most of the edge is rimmed with dense stands of *Typha muelleri*, but where this is broken *Ranunculus* sp., *Myriophyllum* sp., *Potamogeton cheesemani* and *Elodea canadensis* run out into the deep water. Collecting was confined to the southern end of the lagoon away from the *Typha* and in a pond in the southwest corner that became separated from the main lagoon as the water level fell in summer.

The lagoon held enormous numbers of *A. assimilis* and *S. arguta*. In the deeper water the primitive corixid *Diaprepocoris zealandiae* Hale was also very common. Collections from this area allow comparison with those from the Kainga pond and channel and also demonstrate differences in response to changing conditions of species in each family, here occupying the same general habitat and subject to similar environmental conditions.

SAMPLING THE POPULATIONS

THE POND AND CHANNEL AT KAINGA

During late winter when the study began there was little aquatic vegetation and it was not too difficult to devise a sampling method of standard sweeps at a series of stations, typical of the different zones around the pond, to obtain a measure of population size and distribution. In this period two sweeps of two metres each using a 'D' net with the top edge of the net just touching the surface were made at each station. The notonectids taken were counted and after the numbers of the