THE BIOLOGY AND ECOLOGY OF THE BLIND PRAWN, *TYPHLOCARIS GALILEA* CALMAN (DECAPODA, CARIDEA) 1)

BY

M. TSURNAMAL

Department of Zoology, The Hebrew University of Jerusalem, Israel

INTRODUCTION

The blind palaemonid prawn, *Typhlocaris galilea* was first described by Calman (1909) who suggested that because of several peculiar morphological features, this new organism should be assigned to a new genus and be also regarded as the type of a distinct subfamily of the Palaemonidae, the Typhlocaridinae. The description of the new species was based on two specimens which were collected, according to Calman (1909), in "a small pond near the town of Tiberias communicating with the lake [of Tiberias] and fed by a mineral spring". Annandale (1912) and Annandale & Kemp (1913) added some information on the prawn's morphology and made some field observations on its movement and feeding habits. They also described the epigeic habitat of the prawn (an octagonal pool) at Tabgha, on the northern coast of Lake Tiberias, which they regarded as the only site at which *Typhlocaris galilea* may be found. According to these authors the surface of the octagonal pool was "covered by a gigantic grass" and it contained from six to ten feet of brackish and sulphurous water. Annandale had collected and fixed several specimens of *T. galilea*, some of which were later used by Ghosh (1913) in his study on the internal anatomy of this prawn. The presence of a large hypogeal population of *Typhlocaris* in the water tract of the En-Nur spring at Tabgha has already been mentioned by Tsurnamal & Por (1968) who described this subterranean habitat and the organisms in it, associated with the blind prawn.

A second species of *Typhlocaris*, *T. lethaea*, was described by Parisi (1920, 1921) from a cave near Benghazi (Libya) and a third species, *T. salentina*, was discovered and described by Caroli (1923, 1924) in caves near Otranto, Salentina Peninsula (S. Italy). The descriptions of these authors, however, deal mainly with the morphology of the two new species and present very scarce information on the biology or ecology of the prawns.

Por (1963) while discussing the origin of the relict fauna of the Jordan Rift Valley, regarded *T. galilea*, and also the two other congeneric species, as pliocenic marine relicts that had succeeded in surviving to the present, perhaps via preadaptation, because their precursory form was already living in submarine springs and

---

1) Research has been partly supported by the "Mekoroth" Water Co. of Israel.
caves near the shore, or in small rock pools, almost separated from the sea, all along
the shores of the Pliocene Mediterranean Sea. This sea also penetrated into the
area of the recent Jordan Valley (Picard, 1943). A similar view is also held by

Almost nothing is known concerning the habits and environmental requirements
of *T. lembae* and *T. salentina*, while knowledge on *T. galilea* was only slightly
better till recently, being limited to the preliminary report of Annandale & Kemp
(1913).

The aims of the present study have been mainly to gain knowledge on the
biology and ecology of the blind prawn of Galilee, by combining intensive obser-
vations in the natural habitat and in aquaria.

**THE HABITAT**

*Typhlocaris galilea* was investigated at two habitats: at the epigeic octagonal
pool of En-Nur at Tabgha and in the subterranean water tract of a warm sulfur
spring which drains into this pool.

A. The octagonal pool of En-Nur

This pool (about 20 m in diameter) formerly known as “Birkat Ali-Ed-
Dhahar”, is the type locality of *Typhlocaris galilea* and is situated at Tabgha
(Heptapegon), on the northern shore of Lake Tiberias (text-fig. 1, pl. 1a). In
ancient times this pool apparently served merely as a hot mineral bath, but towards
the end of the 19th century or possibly somewhat before, it assumed the function
of a cistern whose brackish sulphurous water powered a water mill near the coast
of the Lake, some 150 m southwards. The pool underwent many changes shortly
after it was visited by Annandale (Annandale & Kemp, 1913). The “grasses”
which then covered its water surface have been cleared away and nowadays it is
enclosed by a roofed building made of dark basalt stones (pl. 1a).

Three different springs flow directly into the octagonal pool. The main spring
(fig. 1, SP. A) is the most saline (2300-3000 mg Cl-/l) and the temperature of
its water is 29-30° C. The water also contains a considerable amount of dissolved
Hydrogen Sulfide (H2S). Oxygen is relatively low: 0.9-2.0 cc/l, and the pH is
in the range of 6.8-6.9. A second large spring enters the pool near its eastern wall
(fig. 1, SP. C). The water of this spring is cooler (27-27.5° C) and the chlorinity
is lower (1300-2000 mg Cl-/l). The O2 content is in the range of 2.5-2.7 cc/l
and the pH 7.1-7.2.

The outflow of the third spring (fig. 1, SP. B) is considerably weaker and
during the dry season and even at the beginning of winter it is hardly detectable.
Its water temperature is in the range of 24-25.5° C and the chlorinity is only
600-1200 mg Cl-/l.

As for the pool itself, its bottom is largely muddy, with a scattering of half-buried
stones, and is overlaid with a fine yellow-brown sediment continuously
washed in by the outflow of the springs. Elongated piles of stones extend between