

Crustacés parasites des
Tuniciers arctiques, par Carl
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and 282

Among the tunicates obtained by dredging in the Arctic Ocean, during the expedition of the Vega, some species, among which special mention may be made of Chelyosoma macleyanum Sow. et Brod., Cynthia echinata L and Molgula ampulloides van Ben., have been submitted to a detailed examination in order to ascertain whether any parasitic crustacea were found inside their branchial sac. A small number of tunicates from previous Swedish expeditions to Spitzbergen and Greenland, and from the Norwegian coast of Denmark, have been examined for the same purpose.

Because the geographic distribution of these parasites in tropical and temperate seas is still little known, and it is not possible to determine whether the parasites of Arctic ascidians belong only to the sea where they are found, the account here given shows that parasites already known inhabit ascidians wherever found, while new parasites, more numerous are found in species of ascidians which have not been heretofore examined in this respect.

Hence the observation already made in many cases is confirmed, that a parasite prefers to live upon a certain genus, or even a certain species of host. The crustacea found in the ascidians examined belong to the orders of Amphipods and Copepods. Among the amphipods two species, Andania pectinata, G. O. Sars, and Aristias tumidus, Kr. have been found parasitic, but only in Spitzbergen and Greenland. Andania pectinata has not yet been found in the interior of ascidians; a detailed description is given, especially of the buccal armature, which differs a little from that of the genus Andania, A. Boeck.

Of the 9 copepods found, 3 species only were known. Among these may be mentioned Idya furcata, Baird, a common species belonging to the family Harpacticidae, and which is found as often in a free state as in ascidians. The two other forms, known from the west coast of Norway and Sweden, have been found in the ascidians of Denmark.

They are Notodelphys agilis, Thor. and Buprorus loveni, Thor. Of the six other copepods, only two belong to a family already known, the Notodelphyidae. They belong to the genus Doropyzus, Thor.; one of the two, D. demissus, n.sp. was found in the branchial sac of Cynthia echinata, L. the other in Chelyosoma macleyanum, Sow. and Brod. Both were taken north of the winter harbor of the Vega.

The remainder of the parasites, 4 species, are arranged, in accord with their buccal armature, in two new families, of which the one is perhaps most closely related to the Ergasilidae. The other which possesses mandibles destined for chewing, belongs to the Notodelphyidae. The 3 species belonging to the first of the families, the Enteropsidae, n.form. were all found in the branchial sac of Molgula ampulloides.

In the genus Enteropsis, n.gen. the feet are simple and the body is vermiform: the genus Haligryps, n.gen. has biramose legs, but armed only with spines and without swimming hairs. The second family, the Schizoproctidae, n. fam. is distinguished by two saccate duplicatures perfectly separated to their base, on the post! part of the thorax, which is very high and compressed, while the abdomen is cylindrical.

Although the exterior of the body thus resembles a little that of the genus Doropygus, Thor. the structure of certain parts of the mouth and antennae is different from that found in the Notodelphyidae. It was found in the inside of a species of Phallusia from Spitzbergen.

The first part of the paper is devoted to a description of the material used in the experiments. The material was obtained from the laboratory of the University of California at Berkeley. It was a mixture of the two isomers of the compound, and was prepared by the method of the authors. The material was purified by the method of the authors. The material was then used in the experiments.

The results of the experiments are given in the following table. The first column gives the concentration of the material, the second column gives the rate of reaction, and the third column gives the order of reaction. The results show that the rate of reaction increases with the concentration of the material, and that the order of reaction is one. This is in agreement with the theory of the authors.

In the second part of the paper, the authors discuss the mechanism of the reaction. They propose that the reaction proceeds through a transition state in which the material is partially broken down. The energy of activation is calculated from the rate of reaction, and is found to be in good agreement with the value calculated from the theory of the authors. This supports the theory of the authors.

Although the experiments in this paper were carried out at a constant temperature, it is interesting to note that the rate of reaction varies with the temperature. This is in agreement with the theory of the authors, which predicts that the rate of reaction should increase with the temperature. The authors have calculated the energy of activation from the rate of reaction at different temperatures, and have found that it is in good agreement with the value calculated from the theory of the authors.