

Occurrence of aquatic insects with algae in Basrah Province

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Abstract

The presence of aquatic insects together with algae was studied over a period from March – September 1997, in nine stations scattered throughout Basrah Province. 19 species of insects belonging to five orders were collected along with 32 algal species in four classes. Some of the aquatic insects were highly restricted in the nine stations, whereas others were more widely distributed throughout the area.

Introduction

ALGAE ARE WIDESPREAD and can be found in nearly all moist situations, where they frequently occur as an extended stratum that consists of either a single species or a mixture of species (Smith 1950). They are the dominant photoautotrophic organism in the aquatic environment (Round 1981).

Algae constitute the major source of energy and organic matter for all other trophic levels in the aquatic environment, and serve as live food for many other organisms (Al-Aaragy 1996; Al-Sabounchi et al. 1990). On the other hand, aquatic insects play an integral role in the ecosystem through integrating the food niche, as they are ingested by different types of aquatic animals such as fish.

Although many studies in Iraq have been carried out that deal with freshwater algae, the literature contains very little information on the relationship between algae and other organisms, especially insects (Mouloud et al. 1980). The aims of the present study are firstly to isolate some of the aquatic insects found with the algae, and secondly to provide preliminary data on the relationship between the insects and the algae.

Materials and Methods

Samples for the present study were collected from nine selected stations distributed along the Shatt al-Arab River from Qurna to Abul-Kasib (Fig. 1) during the period from March – September 1997.

Algal samples were collected from the water surface to the bottom of the river (10-30 cm depth) using a scraping method. Samples were collected and kept in 50 cm³ polyethylene bottles. In the laboratory, samples were washed with tap water to isolate aquatic insects that were either viewed with the naked eye or with the aid of a dissecting microscope. Specimens were preserved in tubes containing 75% alcohol. In order to extract the algae,

the water was filtered through a standard phytoplankton net. All algae were preserved in 4% formalin.

Identification of algae was based on Smith (1950); Prescott (1975); Hadi et al. (1984); Al-Handal et al. (1989), and Al-Sabounchi et al. (1990). Insects were identified with the aid of the following literature: Chu (1949); Usinger (1956); Cranston et al. (1983); Abdul-Karim (1987), and Habeeb (1989).

Results and Discussion

Overall data for the present study have been summarized in Tables 1 and 2. Table 1 shows 19 species of insects in 15 genera, whereas the algae were represented by 32 species belonging to 24 genera (Table 2).

From Table 1, it is apparent that Diptera and Coleoptera are the most dominant aquatic insects, comprising 49.2 % and 29.9 % respectively of the total species recorded. The highest number of species was recorded at Station 3 (10 species) followed by Station 4 (8 species), whereas Station 7 had only 3 species (Table 1).

These results may be due to the nature of the stations themselves. For instance, Station 3 has a great abundance of vegetation and its water was semistable. Conversely, some other stations were poor in vegetation. This is quite in agreement with the conclusion of Wilson (1980), who was working on chironomid larvae. The unexpected result was that of Odonata, which appeared only at three stations and formed 5.3 % of the total, with just one species at each station, as was the case with Ephemeroptera (3.3 %). However, Hemiptera were much more abundant (12.3 %). These variations may be due to the method of collection, which is probably suitable for Diptera and Coleoptera, but not as effective for Odonata, Ephemeroptera, and Hemiptera.

Variation in the distribution of algae among stations is quite clearly evident (Table 2). Bacillariophyceae was the dominant group, represented by 14 species that form 60.2 % of the total, and with the most species at Station 8. Cyanophyceae comprised 21.8 % of the total, with 13 species. Chlorophyceae comprised 16.7 % of the total, with 4 species. Their distribution is nearly even among all stations, with the highest number of species at Station 2. The lowest group in number of species was Bangiophyceae, comprising 1.3 % of the total with only one species, and occurring mainly at Station 2. This diversity in the number of algae among the stations is due to the mixing of river water and to the quality of inorganic materials that affect the biomass of algae (Part 1980).

Table 1. Aquatic insect species abundance at nine stations along the Shatt al-Arab River.

| Orders; families | Species | St1 | St2 | St3 | St4 | St5 | St6 | St7 | St8 | St9 |
|---------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ephemeroptera | | | | | | | | | | |
| Baetidae | <i>Baetis</i> spp. | * | | | | | * | | | |
| Ephemeridae | <i>Ephemerella</i> spp. | | | | | | * | | | |
| Odonata | | | | | | | | | | |
| Aeshnidae | <i>Anax</i> spp. | | | | | * | | | | |
| Coenagrionidae | <i>Ischnura evansi</i> | | | | | | | * | * | |
| Hemiptera | | | | | | | | | | |
| Veliidae | <i>Velia sauli</i> | | * | * | | | * | | | * |
| Belostomatidae | <i>Belostoma</i> <i>cardofanum</i> | | * | | | | | | | |
| Coleoptera | | | | | | | | | | |
| Dytiscidae | <i>Colymbetes piceus</i> | * | * | * | * | * | * | | | * |
| | <i>Hydaticus histrio</i> | * | | * | * | | | | | |
| | <i>Rhantus suturalis</i> | * | | * | | | | | | |
| Hydrophilidae | <i>Berosus luridus</i> | | * | | | | | | | |
| Staphylinidae | <i>Bryobiota</i> spp. | | | * | | | | | | * |
| Diptera | | | | | | | | | | |
| Culicidae | <i>Anopheles multicolor</i> | | | * | | | | | | |
| | <i>An. hyrcanus</i> | | | | * | | | | | |
| | <i>Culex pipiens</i> | * | * | * | * | | | | | |
| Chironomidae | <i>Chironomus piger</i> | * | | | * | * | * | * | | * |
| | <i>C. plumosus</i> | | | * | * | * | | * | * | |
| | <i>C. lacunarius</i> | | | * | | * | | | | * |
| | <i>Cricotopus (C.)</i> <i>bicinctus</i> | * | * | * | * | * | | | | * |
| | <i>Cr. (C.) sylvestris</i> | * | * | | | * | | | | |
| Total | | 7 | 7 | 10 | 8 | 7 | 5 | 3 | 4 | 6 |

Table 2. Genera and species of the algal groups found at the nine stations.

| Orders; families | Species | St1 | St2 | St3 | St4 | St5 | St6 | St7 | St8 | St9 |
|-------------------|------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cyanophyceae | <i>Anabaena</i> sp. | | | * | | | | | | |
| | <i>Aphanocapsa rivalaria</i> | | | | | * | | | | |
| | <i>Chroococcus</i> sp. | * | | | | | | | | * |
| | <i>Lyngbya birga</i> | | | | | * | | | | |
| | <i>Merissopedia rolleri</i> | | | | | | | | * | |
| | <i>Oscillatoria agardhii</i> | | | | | * | | | | |
| | <i>O. formosa</i> | | * | | | | | | | |
| | <i>O. Limosa</i> | | | | | | | | | * |
| | <i>O. prolifera</i> | * | | | * | | | * | | |
| | <i>O. suneta</i> | | * | | | | | | | * |
| | <i>O. subbrevis</i> | | | | | * | | | | |
| | <i>O. tenuis</i> | | * | | | | | | | |
| | <i>Spirulina</i> sp. | | * | | | | | | | |
| Chlorophyceae | <i>Cladophora</i> | | * | | * | * | * | | * | * |
| | <i>glomerata</i> | | | | | | | | | |
| | <i>Pandorina morum</i> | | | | | * | | | | |
| | <i>Rhizocionium</i> | | | * | | | | | | |
| | <i>crassipellitum</i> | | | | | | | | | |
| | <i>Ulothrix cylindricum</i> | * | * | * | * | | | | | |
| Bangiophyceae | <i>Compsopogon</i> sp. | | * | | | | | * | | |
| Bacillariophyceae | <i>Bacillaria pardoxa</i> | | | | | | * | | | * |
| | <i>Cocconeis pediculus</i> | * | * | | | | * | | | * |
| | <i>Cyclotella</i> sp. | * | | | | * | | * | | * |
| | <i>Cyxbella affinis</i> | | * | * | | * | | | | * |
| | <i>C. minuta</i> | * | | | * | | | | | * |
| | <i>Diatoma vulgare</i> | | | | | | | | * | * |
| | <i>Gomphonema</i> sp. | | | | | | | | | * |
| | <i>Gyrosigma</i> sp. | * | * | * | | | | * | * | * |
| | <i>Mastogloia</i> sp. | * | * | * | | * | | | * | * |
| | <i>Navicula</i> spp. | * | * | | * | | * | | | * |
| | <i>Nitzschia obtusa</i> | | | * | | | | | | |
| | <i>Rigicosphaeria</i> | | | | * | | * | | | * |
| | <i>carvato</i> | | | | | | | | | |
| | <i>Synedra ulna</i> | * | | * | * | * | | | | * |
| | <i>Synedra</i> sp. | | | | | | * | | | * |
| Total | | 10 | 13 | 7 | 7 | 10 | 6 | 5 | 16 | 6 |

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