Summary

The present research aimed to study two invertebrate species *Amphibalanus amphitrite* (Darwin, 1854) and *Namalycastis indica* (Southern, 1921) in two stations along Shatt Al-Arab River in Basrah province, southern Iraq. Two stations were selected for this purpose, these two stations were affected by the tidal phenomenon, namely Abu-Alkhaseeb and Karmat Ali.

The samples were collected monthly for the period from October 2015 - September 2016. Environmental factors represented by the temperature (air and water), salinity, pH and dissolved oxygen and biological oxygen demand, calcium and nitrates as well as knowledge of soil tissues were measured. Samples of the animals were collected by five replicates in Abu-Alkhaseeb station and four replicates in the Karmat Ali station, then isolated and washed with running water and preserved in numbered plastic bags and were classified based on the taxonomic keys. The total densities of the two animals were detected in addition to the density in the vertical distribution. The statistical evidence was used to find out the differences in the density. Population sizes of the two animals were study and divided into volumetric categories, the process of separating generations was conducted by using probability graph paper to get the true age of the animal as well as study for each class to learn biomass and secondary production.

The results of the environmental factors showed that the ranges of parameters as following: air temperature 13.5-41.4 °C and water temperature 11.8-34.9° at Abu Al-Khaseeb station; air temperature 11.3-45 °C, water temperature 10-37 °C at Karma Station, pH 6.9-8.8 at Abu Al-Khaseeb station and 7.14-8.5 at Karma station, salinity 4.22-6.6 ppt at Abu Al-Khaseeb station and in Karma station 5-7.1 ppt. For dissolved oxygen 6.2-11.1 mg/L at Abu Al-Khaseeb station and at Karma station 6-12.4 mg/L, biological oxygen demand 1.58-4.02 mg/L at Abu Al-Khaseeb station and 2.04- 5.88 mg/L at Karma station, calcium concentration at Abu Al-Khaseeb station was 160-175 mg/L and Karma station 160-190 mg/L, nitrate concentration 13.9-15.6 mg/L, 14.2-17 mg/L at Abu Al-Khaseeb and Karma stations respectively. And tissues of soil were silty clay Abu Al-Khaseeb station and loamy clay in Karma Ali station.

The monthly density of each animal was calculated at each station. For barnacle the highest percentage was 2740 individuals/m^2 recorded in April 2016 at Abu Al-Khaseeb, the highest percentage in the Karma station was 890 individuals/m^2 recorded in October 2015, and for worms was an average of 70 individuals/m^2 and 184 individuals/m^2 recorded in October and November at Abu Al-Khaseeb and Karma stations respectively. The structure of population sizes was also studied to determine the changes in the population. To illustrate this, it was divided into six categories of barnacle and seven categories of worms.

The study examined the of length-weight relationships (dry, ash and organic matter) and to study the total biomass content and the volume groups of each generation of the two populations by multiplying the density of individual/m^2 for each generation by dry weight, ash and organic matter. Abu Al-Khaseeb had H generation 7.27 g/m^2 dry weight, 5.30 g/m^2 for ash weight and 1.63 g/m^2 for organic matter, H generation in Karma was the highest mass of 2.338 g/m^2 for dry weight and 1.694 g/m^2 for ash weight and 0.527 g/m^2 for organic matter.

The monthly biomass B g/m^2 was calculated from adding of the biomasses for each generation and the average (B) of the biomass was derived from divided the sum of the biomass for the months of the year on total sampling month. Total annual secondary production was calculated for each generation of population groups in terms of dry weight, ash and organic matter using the method which summarized in the calculation of density average multiplied by the difference in weight. The highest value of barnacle at Abu Al-Khaseeb was 14.5367 g/m^2 for ash weight and 4.536 g/m^2 for organic matter, for worms were 2.228 g/m^2 for ash and 2.8397 g/m^2. In the Karmat Ali, the barnacle had 5.800 g/m^2 of ash and 1.0794 g/m^2 of organic matter, the worms had 7.583 g/m^2 for ash and 9.2845 g/m^2 for organic matter.

The rate of growth of the two animals was detected by finding the average length of each generation of the population groups per month for each animal. In order to achieve a curate result on the age of the animal in the field and the calculation of its productivity it was necessary to conduct the process of separation of the generations of the population group and therefore used the Probability graph paper method, the population of both studied animals is polymodel.

Comparative ecological study of two species of invertebrates *Amphibalanus amphitrite* (Darwin, 1854) and *Namalycastis indica* (Southern, 1921) in two stations of Shatt Al-Arab River

Thesis

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