

# [Essay summary of relationship between algae and tidepool chemistry](https://assignbuster.com/essay-summary-of-relationship-between-algae-and-tidepool-chemistry/)

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Relationship between algal cover and water chemistry in rockroses Mad Mukluks Mad Midair ABSTRACT Interstitial Rockford is one of the harshestenvironmentin marine ecosystem. Most of the organisms living in it has to have adoptions to survive in harsh conditions, especially algal. A research was done to see if biotic factors such as temperature, dissolved oxygen, temperature and pH value could have a significant correlation with total percentage of algal cover. Initial hypothesis was dissolved oxygen and pH value are correlated to total algal cover.

Each pool sample's water hammiest were measured and tested for 2 day period. The correlation between dissolved oxygen and algal cover is weak, proving that dissolved oxygen is not fairly important, where pH value has stronger correlation than the other chemical property tested. Most of the rockroses observed has high percentage cover of coralline algal. INTRODUCTION Rocky shore are coastal shores that are consists of hard substrates. It is regarded as the most ecological part of the marine system (Library et al, 2012).

Rocky shore has three zone; low, mid and high with variety of communities living on each interstitial matrix (Phenylalanine's, 2007). High interstitial zone has rockroses and go to several months without being replenished from the seawater (McAllen & Taylor, 2001). Interstitial Rockford have a relative stable environment where that has few changes in terms of physical conditions when the water reaches low tide (Kemp, 2009). Both McAllen & Taylor (2001) and Berkshire et al (1987) stated that rockroses undergoes many extreme physic-chemical conditions and few organisms are able to live in rockroses.

These biotic factors have a significant influence in community dynamics and population (Theatrical, 2002). Thus, it has large abundance of specialized tax vying in rockroses, such as algae (Murals, 2013). The water chemistry of rockroses fluctuates rapidly when low tide, particularly oxygen concentration, pH value, temperature and salinity. Temperature and salinity is important for algae, whereas oxygen concentration and pH value is produced by algae. Oxygen is important to all living organism and the availability of oxygen in rockroses is low, which can lead to hypoxia to organisms living in it (Berkshire et al, 1987).

However, high algal cover could increase the saturation level of oxygen in rockroses, but there is little research done on hyperemia on rockroses. Algae requires sunlight and carbon dioxide for photosynthesis, which in return produce more oxygen in rockroses. It will also produce hydrogen, which makes the Rockford more acidic. Temperature is also important, because the temperature in rockroses is relatively higher than normal seawater temperature. Increasing temperature could affect the algae in terms of physiology and actions of algae (Library et al, 2012).

According to Kemp (2009), increasing water temperature can be caused by long exposure from sunlight and also the location of Rockford. In a study done by Kemp at the coast of South Africa, he water temperature in rockroses were ranging from low ICC to high ICC during peak hours. Nowhere (1998) specified that sunlight has a tremendous effect on primary production in the aquatic system in rockroses. Salinity also can affect the water chemistry of rockroses.

The changing level salinity of rockroses are varied according to location and geographically and it can be caused either by input from seawater during high tide, evaporation and terrestrial runoff or rainfall (Kemp, 2009). Ended et al (2014) showed that salinity has large role in terms of species richness in rockroses. The purpose of this study is to investigate if the total algal cover is being affected by the water chemistry in rockroses during low tide. The aim of this experiment is to observe the relationships between algal cover and water chemistry, especially dissolved oxygen concentration.

I expected to see high level of oxygen saturation in rockroses due to photosynthesis. I also expecting high algal cover in alkaline rockroses. Since there is few fauna living in rockroses, I do not take them as measurement in this experiment because I more interested in functional algal group. From this, I deduced a hypothesis for this experiment. The hypothesis is percentage of algal cover is positively correlated with pH value and dissolved oxygen and negatively correlated with salinity and temperature.

METHOD Location The study site was at Cape Palliates, southern most point in North Island and the experiment ran for three days, from February 1st to February 3rd 2014. Pool sample A transect line of 50 meter was laid out across the high rocky shore and began find suitable Rockford samples. I try to locate good pools sample with pool criteria of a depth of 1 CM, area around 2-mm and the presence of algal cover per pool. I assure depth of each pool by measuring the depth 3 times at different deepest point in the pool to obtain an average depth.

The length of the pool is measured across by a measuring tape. A total of twelve pools that quite meet the measuring criteria similar were marked at high shore in a two day period. As a reference, one pool sample from lower rocky shore was marked and measured to compare water chemistry only. After pools were marked, a CACM x CACM quadrant were put on the pool, a Perspex glass layer with 25 random points were put on top of the quadrant. The quadrant is used to measure percentage of algal cover and functional algal cover y using point intercept method.

Each pool sample has it chemical properties measured on the 2nd and 3rd of February Measurement of oxygen concentration Measurement of oxygen concentration was made by using a portable oxygen measurer that is measured twice, one when the water reached low tide and one an hour later for a maximum exposure from the environment. Measurement of salinity Measurement of Rockford salinity was made by using a refractors. The salinity was measured twice, one when the water reached low tide and one an hour later for a maximum exposure from the environment. Measurement of temperature

The temperature of the Rockford was measured by using a simple thermometer twice, one when the water reached low tide and one an hour later for a maximum exposure from the environment. Measurement of pH value The pH value of the Rockford is measured using a pH meter and measured twice, one when the water reached low tide and one an hour later for a maximum exposure from the environment. However, while measuring the chemical properties of Rockford, I discovered that 5 out the 12 pool sample has geographical problems, such as drainage, constant terrestrial runoff and shadowed that will alter findings.

It was decided that problem pool samples was not counted, and 7 remaining sample is used for the experiment. Statistical analysis I used ASS Enterprise Guide 5. 1 to obtain the linear regression to see the relationship between algal cover with 4 water chemistry; percentage of dissolved oxygen, salinity, temperature and pH value. I also will use ASS to obtain the p-value of each correlation, regression (RE) and F ratio for each correlation. RESULTS Table 1 : measurement of water chemistry of pool sample at low tide after being exposed Pool sample pH value Temperature (co) salinity (US)