

True meaning of 'competition'

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IN THE English language the word "competition" conveys a very straightforward meaning. It is an event that arises when two or more individuals or groups "strive together" (the literal meaning from the Latin roots for the word) for something in short supply, such as a resources like food or light. However, in the study of ecology this clear cut definition of the word competition is not accurate. Since there are many forms of competition and ways in which it can arise.

Therefore, in order to better understand this concept of competition one will have to come up with a more accurate and ecologically based definition of the word.

Such a definition could be as follows, competition is an event which occurs when a valuable or necessary resource is sought after by the same or individuals of different species in order not to go into extinction. This even is brought about mainly because these competing organisms occupy the same niche, which is a multi-dimensional space within

which an organism is able to exist, for example, the type of food, humidity or foraging method used.

However, before going on to give an example, to illustrate the new definition we have come up with, one also has to understand that this event may occur very rapidly or very subtly. But it usually takes a generation in order for the results of competition to be determined. In other words, to determine which species is the victor. This is determined by the number of offspring produced with the victor in this case being the species whose members were able to survive to produce offspring than those of the "losing" species. This competition can take place between members of the same species where it is termed intra-specific competition, for example seedlings of the same plant species striving for sunlight, to photosynthesise and manufacture food. Competition can also take place between members of different species, and is referred to as inter-specific competition, an example being the jaguar and lion which both hunt deer.

Also in the concept of "com-

petition" it must be understood that sometimes there are outright winners and losers. This form of competition is called contest competition. Then there is a form known as "scramble competition" where all of the competitors are after one prize and most if not all come out as immediate winners. An example would be maggots feeding on a piece of meat. All may crowd the carcass and most may consume some of the meat making them immediate winners, but few will survive and go on to pupate and later reproduce.

Now that an ecological definition of competition has been given and the various forms outlined we can now give an example which will illustrate a competitive relationship between two species. In this example we will use two species of Paramecium, *P. aurelia* and *P. bursaria*, with the resource they competing for being food.

In an experiment these two species of Paramecium are placed in a test tube which contains an oatmeal medium, to which food was added in a concentrate form, the tubes were sealed thus forming a simple ecosystem. Over time it was

noticed that the food concentrate settled at the bottom of the tube where *P. aurelia* usually settles with *P. bursaria* occupying the top layer, with a very narrow zone of overlap in the middle where both species can be found. Therefore, it is thought that the bottom of the tube is ideal for growth for both species of Paramecium.

However, it is the *P. aurelia* which becomes extinct in the end.

This is because the high density of the *P. aurelia* at the bottom of the tube drew heavily on the reserve of dissolved oxygen in the water which eventually led to their suffocation. Whereas, the *P. bursaria* at the top of the tube survived because the latter can be considered a "green" Paramecium so that it possess a symbiotic algae called zoochlorella.

Therefore, its location at the top of the tube is ideal for carrying out photosynthesis and producing oxygen.

With the top layer of the medium now oxygen enriched it sends out carriers or members of its colony to forage for food in the anoxic or oxygen deficient depths of the tube where the

food has settled. Hence, it can also be seen that this symbiotic relationship, the *P. bursaria* has with the zoochlorella has given it an advantage in the competition with the *P. aurelia*. Therefore, it can be concluded that the extinction of one species indicates that a competition existed between the two of them for that resource. However, if both had survived and coexisted, one would form an opposite conclusion.

If you think that humans are above such competition you are very wrong. We compete for resources everyday, for housing (suitable habitat), for jobs to get money to get food, clothing and shelter. One of the most important resources that we compete for is oxygen.

The theme of this year's World Environment Day celebrated yesterday (June 5) is "CO2 Kick the Habit - towards a low carbon economy". We keep adding to the carbon dioxide in the world mostly through vehicle and industrial emissions. We are also cutting down the trees which turn this gas into oxygen for us to breathe. So if we keep this up we are jeopardising our survival.