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Sciences

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Biotechnology

A [**system of plant taxonomy**](https://en.m.wikipedia.org/wiki/List_of_systems_of_plant_taxonomy), the **Eichler system** was the first [**phylogenetic**](https://en.m.wikipedia.org/wiki/Phylogenetic) (phyletic) or [**evolutionary**](https://en.m.wikipedia.org/wiki/Evolution) system. It was developed by [**August W. Eichler**](https://en.m.wikipedia.org/wiki/August_W._Eichler) (1839–1887), initially in his *Blüthendiagramme* (1875–1878) and then in successive editions of his *Syllabus* (1876–1890). After his death his colleague [**Adolf Engler**](https://en.m.wikipedia.org/wiki/Adolf_Engler) (1844–1930) continued its development, and it became widely accepted

1. The system was based on dividing the [**plant kingdom**](https://en.m.wikipedia.org/wiki/Plant_kingdom) into those plants with concealed reproductive organs (non-floral), the (**[Cryptogamae](https://en.m.wikipedia.org/wiki/Cryptogamae" \o "Cryptogamae)**, = hidden reproduction) and those with visible reproductive organs (floral), the (**[Phanerogamae](https://en.m.wikipedia.org/wiki/Phanerogamae" \o "Phanerogamae)**, = visible reproduction). Moreover, Eichler was the first taxonomist to separate the Phanerogamae into [**Angiosperms**](https://en.m.wikipedia.org/wiki/Angiosperms) and [**Gymnosperms**](https://en.m.wikipedia.org/wiki/Gymnosperms) and the former into **[Monocotyledonae](https://en.m.wikipedia.org/wiki/Monocotyledons" \o "Monocotyledons)** and **[Dicotyledonae](https://en.m.wikipedia.org/wiki/Dicotyledons" \o "Dicotyledons)**. His primary ranks were Divisions (*Abtheilung*), followed by orders (*Reihe*).

## Uses for Algae

### Food

Numerous cultures around the world consider algae an important source of nourishment. Citizens living in European countries such as [**Ireland**](https://www.worldatlas.com/webimage/countrys/europe/ie.htm), [**Scotland**](https://www.worldatlas.com/webimage/countrys/europe/uks.htm), [**France**](https://www.worldatlas.com/webimage/countrys/europe/fr.htm), [**Germany**](https://www.worldatlas.com/webimage/countrys/europe/de.htm), [**Norway**](https://www.worldatlas.com/webimage/countrys/europe/no.htm), and [**Sweden**](https://www.worldatlas.com/webimage/countrys/europe/se.htm), as well as populations living in North and South America, and Asian nations such as [**China**](https://www.worldatlas.com/webimage/countrys/asia/cn.htm) and [**Japan**](https://www.worldatlas.com/webimage/countrys/asia/jp.htm) use algae as a key ingredient in a number of local dishes. These meals can include algae as part of a salad, accompanying meat in a fried dish, as a topping on oatmeal, or even in liquid form as an extract in a nutritious smoothie.

Algae contains several healthy elements including carbohydrates, fats, proteins, and vitamins A, B, C, and E. Not only is algae considered by many consumers worldwide to be a low cost source of protein, but it also contains a number of important minerals such as iron, potassium, magnesium, calcium, manganese, and zinc. Foods which commonly contain algae include a variety of dairy products such as milk, ice cream, cheese, whipped topping, as well as syrup, icing, fruit juice, and even salad dressings. Brown algae, in particular, is used in order to stabilize, thicken, and emulsify numerous food products, while red algae is used in the preparation of various semi-solid products as wide-ranging as medicines, cosmetics, and in the production of a wide array of foods

### Fodder

Algae, especially seaweed, is used as a feed for a variety of farm animals. For example, Rhodymenia palmate, or so-called "Sheep’s weed," is used in order to feed livestock such as cattle and chickens. Algae is used as fodder in various countries, such as the northern European nations of Sweden, [**Denmark**](https://www.worldatlas.com/webimage/countrys/europe/dk.htm), and Norway, as well as in Scotland, China, [**New Zealand**](https://www.worldatlas.com/webimage/countrys/oceania/nz.htm), and throughout North and South America.

### Pisciculture

The industry involved in the breeding and farming of fish, also known as fish farming or pisciculture, also utilizes algae as part of its production process. According to scientists, numerous species of fish like to consume a variety of types of algae, the most common sources being blue-green and green algae, as well as with microalgae. Fish usually feed on floating plankton and zooplankton, which provides a source of healthy vitamins. Algae is also used in pisciculture as a way in which to naturally absorb carbon dioxide from the environment, while at the same time providing oxygen to the water, thus making the marine environment more habitable for fish.

### Fertilizer

The two most common varieties of algae used in the manufacture of fertilizer are large red and brown. In particular, these two types of algae are utilized in areas located near the ocean. Liquid fertilizer can also be produced using a concentrated seaweed extract. The reasons why this type of fertilizer is so popular involves the organism’s ability to repair levels of nitrogen already present in the soil. For example, rice producers in [**India**](https://www.worldatlas.com/webimage/countrys/asia/in.htm) typically employ blue-green algae in order to fertilize their agricultural fields.

### Reclaiming Alkaline

In many countries, such as India, fields that once produced large agricultural yields can no longer be used due to high concentrations of alkalinity in the soil. In order for crops to eventually be grown in these lands, often referred to as "Usar" lands, the ph level must be lowered and the ability of the soil to hold onto water must be increased. This process can be achieved using blue-green algae.

1. **Yeasts** are unicellular eukaryotic fungi with completely different properties from those of bacteria, which are Prokaryotic microorganisms. **Yeast** contains almost the same organelles of a mature eukaryotic **cell**.

* **Yeasts**, like all fungi, may have asexual and sexual **reproductive** cycles. The most common mode of vegetative **growth** in **yeast** is asexual **reproduction** by budding, where a small bud (also known as a bleb or daughter **cell**) is formed on the parent **cell**. Haploid **cells** may then **reproduce** asexually by mitosis.
* **Types of colonial algae exist in two forms**
* As filaments (volvox)
* And as a colony (spyrogira)

1. The largest and most **complex** marine **algae** are called seaweeds, while the most **complex** freshwater **forms** are the Charophyta, a division of green **algae** which includes, for example, Spirogyra and stoneworts