



## Eusociality

Eusociality means animals living in a group with only one queen (or a king and queen in diploid species) that have evolved into castes with both reproductive and non-reproductive individuals.

Many animals live in groups, flocks, or colonies but although there is a general group, within it each individual functions in a way most likely to benefit the individual, rather than the group. Eusociality takes things a step further.

In advanced eusocial species, the castes may even have morphological changes to assist them in fulfilling their role in the colony.

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## Haplodiploidy & Diplodiploidy

Haplodiploidy means that fertilized eggs develop into one sex (usually female), while unfertilized eggs are the opposite sex.

This means that the sex that develops from the fertilized eggs is more closely related to other members of its sex than it is to the sex that comes from the unfertilized eggs. This occurs in many species of hymenoptera (bees and wasps).

In diplodiploidy species, fertilized eggs develop into both sexes and unfertilized eggs don't develop at all.

## Animals That Are Eusocial

When you mention eusociality most people automatically think of bees, wasps, and ants.

However, only approximately 300-400 species of bee are eusocial out of the over 4,000 bee species. Most wasps are not eusocial, although about 900 species are. Almost all of the 14,000 species of ant are eusocial.

There are other insect species that have developed eusociality including some thrips (Thysanoptera – 6 species), one beetle (Coleoptera) species, true bugs (Hemiptera – 50 species), and all the termite (Isoptera) species.

There is also a species of snapping shrimp that is eusocial and two mammalian species of mole rat – the Damaraland mole rat and the naked mole rat.

## Evolution of Eusociality

For many years the only species that scientists knew were eusocial were bees and wasps, both of which are haplodiploid. This led to the theory of kin selection to explain why some individuals gave up their ability to pass on their genes to help the colony queen raise her young.

Kin selection theory says that because the females were so closely related, by assisting her they were really passing on most of the same genes as they possessed. Now, although kin selection certainly occurs it is not considered to be at the base of [eusociality evolution](#) [1].

There are some definite benefits that come with group living including improved foraging abilities and protection against invaders but there is also the loss of the ability to reproduce and pass your genes on in most cases.

In some cases, individuals are sent out to start new colonies which would improve an individual's reproductive success immensely. This is a hot area of research.

Eusocial organisms are often highly successful and the most advanced species within their groups. Technically, humans are eusocial although there have been some changes to it with our own evolution. This is a promising field of research.

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### Links:

[1] <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3279739/>, [2]

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