
1 Introduction

Nature's Vast Pharmacy

Many people have their doubts about using maggots as medicine. However, they should bear in mind that a vast number of drugs come from nature's pharmacy.

Hirudin, a pharmaceutical agent used to dissolve blood clots, is a good example. This naturally occurring anticoagulant was isolated from the saliva of the medicinal leech. Hirudin serves to keep the blood flowing freely so that the leech can easily ingest it after biting its host. The salivary secretions of bats and snakes contain similar anticoagulants. To this day, the well-known antibiotic penicillin is fermented from a mold that produces the compound to kill its bacterial competitors. The *Cantharanthus roseus* plant is a natural source of antineoplastic alkaloids (vinblastine and vincristine) used to destroy malignant tumors. The drugs derived from this plant alone net more than \$ 180 million in sales each year. The list goes on and on.

Few people realize just how much the pharmaceutical industry depends on natural organisms for drug manufacture. Of all prescription drugs sold, 25 % are derived from plants, 13 % from micro-organisms, and 3 % from animals. Accordingly, over 40 % of our pharmaceutical drugs come from nature.

Insects are a real treasure-trove of raw materials for drug manufacture. They produce a variety of active biochemicals, including sex pheromones, alarm pheromones, defensive substances, and venoms. For example, honey bee venom has long been used to treat arthritis, and butterfly, beetle, and wasp venom extracts appear to be effective in fighting cancer.

How and why did these useful substances come to exist? The secret lies in organic evolution. In the course of its phylogenetic

history, each living organism has evolved into a living chemical factory that produces the substances it specifically requires to survive in a hostile environment.

Millions of years of natural selection and adaptation have turned the most diverse organisms into chemists of immeasurable ingenuity—true masters in solving some of the same biological problems that also undermine the health of humans and other organisms.

The world wars waged in the first half of the 20th century brought devastation and great suffering to humankind. War injuries often resulted in incurable infections of the bone. In many cases, limb amputation was the only recourse for their survival. This dark picture was slightly brightened by countless reports of soldiers whose maggot-laden wounds were free of infection. Soon it became clear that the maggots were responsible for saving many lives and limbs. Thus maggot debridement therapy (MDT) was born.

Indeed, Hippocrates' maxim is as applicable today as it was some 2 400 years ago: "*medicus curat, natura sanat*" (the doctor administers the cure, nature does the healing).