



Medical Values of Some Insects

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Abstract: Insect materials extracted from them had been used as medicinal resources using human cultures all over the international. Besides medicinal drugs, those organisms have additionally performed mystical and magical roles in the remedy of numerous illnesses in a variety of cultures. Technology has already demonstrated the life of immunological, analgesic, antibacterial, diuretic, anesthetic, and anti-rheumatic properties within the bodies of insects. Numerous researchers have surveyed the therapeutic capability of bugs, either recording conventional scientific practices or employing insects and their products at the laboratory and/or clinical degree. As a consequence, bugs seem to constitute a nearly inexhaustible supply for pharmacological research. Chemical studies are hard to discover the biologically active compounds which are simply present inside insect bodies.

Keywords: Medicinal Values; Insect; Pharmacological Activity; Antimicrobial Activity

1. Introduction

Insects are the biggest gathering of living life forms. It has been assessed that more than 1,000,000 types of insects have been depicted, containing about 70% of all living beings.^[1] Their richness and variety imply that insects have a close relationship with people and bug assets have been utilized by individuals for quite a while as food, medication, and compound materials. The restorative employments of insects and other arthropods are significant in treating different illnesses and wounds and have a long convention that can be successful and give results. It has been suggested that international as a minimum 1000 species of insects are used therapeutically and given the dearth of information in this field the actual discern may additionally be considerably higher.^[2] Insects and other arthropods give fixings that have been a staple of conventional medication for quite a long time in parts of East Asia, Africa, South America, and so forth.^[3,4] Bugs produce a complicated and various set of chemical compounds for survival and defense. Antimicrobial peptides (AMPs), produced by way of maximum bugs, typically have a wide spectrum of hobbies and the capacity to pass the resistance mechanisms of classical antibiotics.^[5] The use of insect as a natural product having potential source as a medicine that is useful in curing as well as giving protection from the diseases.^[6] Medicinal insects, which are used live, cooked, ground, in infusions, in plasters, or as

ointments, provide honey, nests, eggs, cocoons, sting, wax, and parts of their bodies for the elaboration of folk remedies to treat a great variety of locally diagnosed ailments.^[7] Edible insects constitute a good source not only of protein, fats, carbohydrates and vitamins.^[8] Keeping in view the energy conversion efficiency of insects relative to livestock, insects are environmentally-friendly alternative protein sources.^[9]

2. South American Jungle Ants Relieve Arthritis

Miami university researchers recently completed their first controlled study of ant venom's benefits for rheumatoid arthritis patients. In a 16-patient cohort, half was injected with radically diluted venom extract while the other half was injected with placebo. The eight patients who received the venom derivative showed dramatic reduction in the number and intensity of inflamed joints, and they showed marked increases in their freedom of motion. Patients who received the placebo showed little or no improvement (Fig. 1). "They weren't even in the same ballpark" said one researcher. None of the patients had an allergic reaction to the venom, and none had experienced even mild side effect. A partially purified extract of ant venom from the South American tree ant *Pseudomyrmex* sp. was tested in a double-blind, managed to observe patients with rheumatoid arthritis. Venom-handled sufferers verified



Fig. 1. South American Jungle Ants



Fig. 3. Grasshoppers



Fig. 2. Honey bee



Fig. 4. Blister Beetles

a development in international efficacy and a lower quantity of gentle/painful joints and swollen joints.^[10] The mound-constructing crimson wood ant, *Formica rufa* L., has an extended way of life of use in remedies in Sweden and neighbouring international locations and has been available as oleum (oil) and acid in the pharmacies at least for the reason that 17th century It turned into a considerable belief that the formic acid might be used to treat numerous sicknesses, mainly gout, and rheumatism.^[11]

3. Bee Venom Therapy

Honey bee (*Apis mellifera*) venom, propolis, royal jelly, beeswax, and honey all are used therapeutically (Fig. 2). Medicinal use of any of these products can be considered to be “Apitherapy”, but many authorities use the term specifically to denote the clinical use of honey bee venom itself. Bee venom also known as apitoxin contains more than 40 biologically and pharmacologically active compounds. A mature defender or forager contains about 100-150 µg of venom, and it injects 0.15 – 0.30 mg of venom via its stinger, a honeybee can inject 0.1 mg of venom via its stinger. When queens emerge, they produce the most venom, probably because they are preparing for combat with other queens. About 700 grams of venom are contained in a young queen.^[12] Bee venom therapy has been used successfully to treat rheumatologic disorders (rheumatoid and psoriatic arthritis, gout, fibromyalgia), neurological diseases (multiple sclerosis, chronic pain syndromes), immunological diseases (scleroderma, systemic lupus erythematosus), and other chronic illnesses. Bee venom

contains a multitude of polypeptides, enzymes (phos-pholipase A2, hyaluronidase), and biologically active amines (his-tamine, dopamine, and noradrenaline). The mechanisms by which venom exerts its beneficial actions are unknown, but might include an anti-inflammatory effect resulting from alterations seen in pituitary and adrenal gland function, local effects on the nerves and blood vessels, and stimulation of acupuncture-like pathways.

4. Grasshoppers have Potential for Blood Circulation

For more than 50 years, grasshoppers have numbered among bio-medical researchers’ best friends. Several African cultures use poultices made from ground grasshoppers as pain relievers, especially for migraines (Fig. 3). Working from a missionary physician’s 75-year- old report of grasshopper poisoning on the African savannah, some neurologists hypothesize that grasshopper toxins stimulate the human central nervous system and subsequently dilate blood vessels increasing circulation. Given blood vessel constriction triggers migraines, grasshoppers’ therapeutic benefits seem perfectly logical. Reparations and medicaments derived from grasshoppers are mostly used for curing such diseases as respiratory disorders.^[13] The nutritional and commercial potential of the edible grasshopper (*Ruspolia nitidula*, *nene* in Luganda), a delicacy in Uganda and many East African tribes, is limited by a short shelf life and unverified nutritional value.^[14]



Fig. 5. Termites



Fig. 7. Black Mountain Ants



Fig. 6. Silkworm

5. Blister Beetles Fight Cancer

Blister beetles secrete Cantharidin, which acts as a powerful protein blocker in the human body. Among immunologists, Cantharidin has been proved effective in treating severe viral infections at first, because of its ability to prevent some viral cells' reproduction and its ability to reduce other cells' virulence. Researchers subsequently discovered that Cantharidin reacts with hostile cells' genetic material and therefore it may be useful in treatment of cancerous tumours which are most resistant to radiation and chemotherapy (Fig. 4). It also reduced the urinary tract infections, insect bites, kidney problems, and first and second degree burns and scalds.

Cantharidin is an active constituent of blister beetles (cantharides) which have traditionally been used for cytotoxic effect on various cancer cells.^[15] It is used in Chinese medicine and has been categorized as highly toxic in the Chinese pharmacopeia.^[16]

6. Termites Extracts Prevents the Arthritis Disease

Ayurveda practitioners estimate approximately one in every 1,000 Indian adults suffers from Ooru Sthambam, a muscular frequently mistaken for arthritis and exacerbated by standard arthritis treatments. Unlike arthritis, Ooru Sthambam does not attack joints; instead, it creates numbness and decreased circulation in patients' upper-thigh muscles. Ayurveda practitioners apply a compound of termite sand and mustard oil around patients' thighs, leaving the mixture in place for approximately 25 minutes or until a burning sensation develops. Treatments continue for 25 minutes each day until patients experience relief. Practitioners report mild cases usually respond to termite sand treatments in a day or two; the most severe case on record required four months of daily treatment.

Ayurveda experts insist their termite sand and mustard oil formula is the only effective remedy for Ooru Sthambam, and they have found that termite sand or mustard oil alone brings no relief. They have also found that termite sand appears to have no other medical uses (Fig. 5).

7. Silkworm Extract Supplements for Blood Circulation

Asian healers use silkworm extracts to treat everything from flatulence to seizure disorders and they often mix silkworm extracts with ginseng, Ma Huang, and saw palmetto to promote male potency (Fig. 6). Emerging science suggests that silkworm extracts may have special benefits as dietary supplements for patients with heart disease and circulatory disorders; because preliminary studies indicated that they reduced serum cholesterol and dissolve vascular plaque. A few optimistic pharmacists speculate that silkworm extracts may prove effective as the most popular anti-cholesterol medications without harmful side effects for users' livers and kidneys. Silkworm pupae (SWP), a major by-product of the silk reeling industry, can be used as an alternative dietary supplement with high nutritional and therapeutic value.^[17]

8. Black Mountain Ants vie with Viagra

The Black Mountain ant extract, however may actually qualify as "the real deal", a perfectly natural alternative to ED medications that work by dilating blood vessels that supply the penis. Science confirms vendors' claims, "Black Mountain ant extract works by directly entering the penis to regulate the expansion of the blood vessels, help encourage the circulation of blood, and enhance the content of androgens in the blood." The extract appears to have no harmful side effects, and the records show no one ever has suffered an allergic reaction to the derivative of the black ant's toxins (Fig. 7). Genuinely skilled herbalists mix ant extract with ginseng and other mild stimulants that reinforce the action of vasodilators.

9. Centipede Extract Stimulate the Liver and Kidney Function

The Properly formulated centipede supplements do appear to stimulate healthy functions in patients' kidneys and livers. Centipede extracts stand-out as the only insect derivatives that usually arrive with warnings against use by pregnant and breast-feeding women,



Fig. 8. Centipede



Fig. 9. Fruit fly

because centipedes secrete stronger toxins than other medicinal insects and the toxins' effects are much more severe than majority of other toxins (Fig. 8). Some of the venom-derived drugs have been approved for use in treatment for pathophysiological conditions, including chronic pain, diabetes and hypertension.^[18]

10. Fruit Fly

Fruit fly is the type of insect which can detect one of the treacherous diseases which we called cancer (Fig. 9). Cancer cells exhibit a metabolism that is fundamentally altered as compared to that of normal cells leading to changes in the tumour's microenvironment, in lipid peroxidation activity and to a variety of potential intra- and extracellular cancer-specific markers. Thus, quantitative and qualitative variations of metabolites provide important information on cell condition. Fruit flies also inherently offer many advantages as an experimental animal model.^[7] The fruit fly can be used as a model to test the effects of novel drugs on the biochemical pathways conserved within humans that control many key cellular activities for tissue regeneration such as cell division, differentiation, and movement. New drugs can be tested in *Drosophila* much faster than in mammalian models; indeed they may even be used for the initial high-throughput screening process as an alternative to cell culture.^[19] A brief generation time, low maintenance costs, and the availability of powerful genetic tools, allow the fruit fly to be eligible to study complex pathways relevant in biomedical research, including cancer. Indeed, publications that use flies to model cancer have exponentially increased in the last 10 years.^[20] Lung cancer is a major cause of death in the world, and the standard therapeutic strategy used is chemotherapy because target therapies only decrease tumor growth and result in high toxicity. Recently, a new *Drosophila* lung

cancer model was developed exploiting the tubular structure of the tracheal network,^[21] and considered functionally and anatomically comparable to the vertebrate airways.^[22]

11. Conclusions

The purpose of the current study is to zero in on the utilization of insects as a characteristic item having a likely source as a medication that is helpful in relieving just as giving assurance from the infections. The research has demonstrated that insects are the principle asset for new medications. Albeit numerous parts of therapeutic insects have been examined and significant outcomes have been accomplished. Here are the significant recent advances in developing insect as potential new alternative medicinal drugs. This is an exciting and rapidly expanding new field since insects are hugely variable and have utilized an enormous range of natural products to cope up the environmental perturbations for many years.

Conflicts of Interest

The author declares no conflict of interest.

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