International Research Journal on Advanced Engineering and Management
https://goldncloudpublications.com
https://doi.org/10.47392/IRJAEM.2024.0149
e ISSN: 2584-2854
Volume: 02
Issue: 04 April 2024
Page No: 1135-1137

Aqua Phyto biotics……. The Aqua Herbals

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Abstract

Research in the field of animal nutrition has recently begun to pay more attention to biologically active substances in plants, calling them Phytobiotics for growth and health and disease management of animals. Phytobiotics are plant derived products added to feed for their beneficial effect on gut, immunity, health, growth and performance. Phytobiotics from Garlic, Pepper, Neem, Turmeric, Ginger etc, have been used as plant doctors to treat ailments since time immemorial. These seem to be substituting the antibiotics with better treatment efficiency and zero side effects. The beneficial effect of these Phytobiotics can be attributed to activation of feed intake, secretion of digestive juices and enzymes, immunity enhancement, anti-oxidant, anti-inflammatory and anti-microbial (viral, bacterial, protozoan etc) properties. These Phytobiotics have influenced the economics of production too attributing to a 30% reduction in production costs, management friendly with a safe environ for the animal and its end consumer the human.

Keywords: *Ailments; Economics; Medicinal Properties; Phytobiotics; Plant Doctors; Treatment.*

1. Introduction

Use of plants for healing, predates recorded history forming much of the origin of modern medicine in animals, more so in humans. As per a recorded estimation, there are nearly 5,00,000 spp. Of plants on the earth and every single plant has its importance. Hippocrates in the 5th century BC mentioned about 300 – 400 plants, terming them as useful. Diascorides in the 1st century BC wrote “DE MATERIA MEDICA”, a medicinal plant catalogue. Plant and plant parts termed as “Herbals” are used as health agents- as anti-stress, anti-viral, anti-bacterial, anti-pathogenic or anti-microbial [1-3]. They are also used as growth promoters, appetite stimulators, immune stimulants and health enhancers. All these activities of the plants are possible due to certain substances they possess like Alkaloids, Terepenoids, Flavinoids, Tannins, Saponins etc., the main function of these in the plant is to activate their defence mechanism.

- Terepinoids give odour and flavour
- Quinones and Tannins give pigmentation
- Phenolics and Polyphenols like Cinnamic acid and Caffeic acid due to their high oxidation state are treated as antiviral, antibacterial and antifungal componenets.
- Catechol is toxic to micro-organisms; this phenolic toxicity is due to enzyme inhibition.
- Quinones, due to the stable free radicals inactivate the microbial protein making them inactive in its turn [4].
- Catechin, a flavinoid inhibits vibriosis by inactivation of bacterial cell wall proteins.
- Tannins are considered toxic and inhibitory to the filamentous algae, bacteria and fungi.
- Coumarins, act as anti-inflammatory and vaso dialators.
- Terepenoids, especially Betulinic acid present in them is active against bacteria, virus and fungi [5].

2. Method

Multi-disciplinary team of academic staff, extension staff, veterinarian, animal enthusiast and the working team, selected the KOLLERU belt of Andhra Pradesh as the study area. On reaching the designated place a stake holders and villagers meeting was conducted [6]. The concerned were questioned as to what kind of plant matter was used by them in their culture,

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for what purpose they used them as per their traditional knowledge and collected samples of the same. These samples were then taken to the lab wherein a qualitative analysis was done on the different samples.

3. Results and Discussion

The forms of application like the samples is also varied, to mention the important forms like herbal powders, herbal liquids, herbal powder extract, herbal liquid extract, mainly given directly or through food or added to the water directly in some cases. So, the medicinal herbs that are used in aquaculture could be broadly categorised into antibacterial, antiviral, antifungal, antiparasitic, anti-oxidants, growth promoters, immune stimulants and adjuvants [7-9].

3.1. Herbal Anti-Bacterials

Herbs like Ixora coccinea, Tridax, Azardarictha indica, Terminalia arjuna, Curcuma longa, Ocimum sanctum, Ocimum basilicum, Allium sativum, Phyllanthus niruri, Aloe vera, Thymus, Lavender etc, are some anti bacterials. These contain anti-bacterial substances like Phenols, Polyphenols, Catechins, Tannins, Terepenoids, Lecithins, Gingerols, Paradols and Eugenol, to mention a few [10].

3.2. Anti-Virals

Herbs like Aconitum nosatum, Nerium, Oleander, Punica granatum, Eucalyptus, Phyllanthus niruri, Aegele marmelos, Cassia occidentalis, Solanum nigrum, Berberin, Thymus, Curcuma, Azardarictha etc., are all good virals. These contain antiviral substances like Alkaloids, Lecithins, Caryophyllene, Eugenol, Cinnamoldehyde, Curcumin, Epicatechin, Coumaric acid, Catechins, Vanillic acid, Synergic acid, Quercetin, Saponins, Azardaricthin, Terepenoids, Coumarins, Flavinoids, Resercylic acid, seem to have good antiviral activity [11].

3.3. Herbal Antifungals

Herbs like Euphorbia, Magnolia, Black thyme (*Thymbra sepicata*), Withania, Piper nigrum, Aegle omits, Phyllanthus, *Azardarictha, Ocimum basilicum* (holy basil), *Zingiber officinale*, Echinecia etc, show antifungal activity. Tannins, Terepenoids (Betulinic acid), Alkaloids like Morphine & heroin, Lecethins some polypeptides, Lactone (withfarin) and Piperines have antifungal activity [12].

3.4. Herbal Anti Parasitic & Anti Microbials

Plants like Terminalia, Allium, Phyllanthus, Azardarictha, *Psidium guajava* (guava), *Ocimum*, *Solanum*, Andrographis, Rosemary, Thyme, *Carica papaya* (Papaya), Clove, Zingiber, Mint, Eucalyptus have anti-microbial activity. These contain substances like Phenols, Gallic acid, Oenothein, Eugenol, Polypeptides, Camphor etc are some that show anti-microbial activity.

3.5. Herbal Antioxidants

Plants like Cynodon, *Aegele marmelos*, Withania, Ginger, Garlic etc show anti-oxidant activity. They contain Phenols, Oregano sulphur, Saponins, Flavinoids which act as anti-oxidants.

3.6. Herbal Immunostimulants

Astragalus radix, Gonoderma, *Eclipta alba*, Crysanthimum, Ocimum, Azardarictha, etc act as good immune stimulants along with Glychirrhiza, Emblica, Curcuma, Adathoda, Cytodon, Withania and Zingiber.

3.7.Herbal De Worming, Gas Absorbing & Anti Stress Agents

Withania sominifera, Emblica, Asparagus, Ocimum, Tribulus, Piper nigrum, Piper longum are claimed to have adaptogenic, anabolic effects and the ability to improve vital energy. The Bioflavinoids and Rutins help reduce stress [13-15]. Saponins from Yucca and Methi help in gas absorption. Leaf extracts of Acacia, Allium, Sorghum, Zingiber, Ficus, Cucurbita, show anti helminthic activity.

Conclusion

Livestock sector contributes to nearly 30% of our country's GDP, of this Aquaculture has a stake hold of nearly 5%. With this economic growth, so also there is growth in the outbreak of diseases in this sector. This remains a major challenge with restriction of medicine usage added to this. To combat this sourcing an alternative has become a necessity [16]. Though not an invention or to say technological outbreak, we have nature's abundance to benefit and assist mankind. The plants and their by products are seen as an alternative to the synthetic medicines in this

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regard. The naturally available medicinal plants fortified with a variety of active substances that are helpful in enhancing the biological activity and also to curb the activity of the pathogens. The aim of this paper is to show how nature can balance and help its species if properly used [17]. The potential of the medicinal plants is yet to be exploited. To prove that plants are all-rounders with potential still untapped, taking aquaculture as one component from the vast extreme of life around.

Acknowledgements

The Authors and The Research Team Wish to Acknowledge the Support of The Management & Staff of Andhra Loyola College Vijayawada, For Extending Their Support to Take Up This Study, For the Lab and Also Their Cooperation During the Field Work. The Authors and The Team Extend Their Sincere Gratitude to The Management and Staff Advance Aqua Bio Technologies India Pvt. Ltd, Vijayawada. This Work Would Not Have Been Easy Without the Help and Permission from The Management and The Entire Team. Thanks To the Agriculture And Live Stock Development Officers, Andhra Region for All Their Technical and Non-Technical Assistance.

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