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Impact of *Azadirachta indica (V)* wild plants extracts for their potential use as biopesticides on different pests of tomato

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Abstract
The proposed investigation was help in finding out alternate ways of controlling pests, with locally available wild plant extracts. This has been also help in bio-controlling of pests without harming the environment. This was help in production of low cost, environment friendly and effective Bio-pesticides which can be locally produced even by the end users (farmers) these bio-pesticides should be less harmful than conventional pesticides. They have cheap and effective in controlling agricultural pests and indicate that plant extracts have great potential as an alternative strategy to pesticides for vegetable pests. They help in avoiding or reducing the pollution problems. When used as a component of integrated pest management programs, Bio-pesticides can greatly decrease the use of conventional pesticides, without altering the crop yields. *Azadirachta indica (V)* were fond to be very effective and showed 100% mortality or inactive the various pest of tomato after spraying 2 to 3 days was observed. The plant extract in 5% leaves solutions less affected when compared to 10% seeds extracts of pest of tomato.

Keywords: *Azadirachta indica*, bio-pesticides, pest, vegetables

Introduction
A number of chemical pesticides are available in markets for the control of pest of vegetables. However their indiscriminate use has created the problems of air, soil and water pollutions, development of resistance in target insect pest and serious health hazards due to the toxicity of their residues. Efforts are being done for finding alternatives to chemical insectcides to overcome these problems.
A survey of literature indicted that very little attention has been paid to this important area of research. Attempts were made in the past by different authors studying the bio-efficacy of different plant extracts on different pests (Saxena, Tsado and Tanko, 2000; Anjorin et al., 2004 Singh and Saratchandra, 2005 and Ezekiel et al 2008) [1]. *Azadirachta indica (V)* (neem) is an omnipotent tree and a sacred gift of nature. Neem tree is mainly cultivated in the Indian subcontinent. Neem is a member of the mahogany family, Meliaceae. Today it is known by the botanical name *Azadirachta indica* (*A. indica*) A. Juss. Neem has been used extensively by humankind to treat various ailments before the availability of written records which recorded the beginning of history. Since prehistoric times, neem has been used by humankind.
Pesticides are substances or mixture of substances used to prevent, destroy, repel, attract, sterilize, or mitigate pests. Biopesticides are a type of pesticide derived from natural materials as animals, plants, bacteria, and certain minerals (Nelson and William, 2004) [7]. Although chemical pest control agents are extensively used in all countries of the world but they are regarded as ecologically unacceptable. Therefore, there is an increased social pressure to replace them gradually with biopesticides which are safe to humans and non-target organisms (Isalma et al., 2010).
The tomato is a major vegetable crop that has achieves tremendous popularity over the last century. Tomatoes, aside from being tasty, are very healthy as they are a good source of vitamins A and C. Vitamin A is important for bone growth, cell division and differentiation, for helping in the regulation of immune system and maintaining surface linings of eyes, respiratory, urinary and intestinal tracts. Vitamin C is important in forming collagen, a protein that gives structures to bones, cartilage, muscle and blood vessels (Olaniyi *et al*, 2010) [4]. The present investigation was under taken to the studying the bio-efficacy of *Azadirachta indica* plant leaves and seeds extracts on different pests of tomato.

Methodology
Experimental Plant Material
The experimental plant material was used in the present investigation is tomato (*Lycopersicon esculentum* L) Var. Vaishali, which is extensively cultivated in and around Bhende village. Tomato crop were raised in the experimental fields employing conventional cultural practices. The field was marked in to several small plots of 5 X 5 m size. Seedlings were provided with uniform agricultural practices and reared uniformly. The *Azadirachta indica (V)* were screened for insecticidal activity against tomato pests. The Leaves and seeds were used as insecticidal properties

Common Pests found on Tomato
The tomato plants were attacked by various insect pests. Important among them are *Spodoptera exiava* (tomato army worm), *Circulifer tenellus* (Leaf hopper), *Agrotis ipsilon* (Cut worm), *Epitrix nirtipemnis* (flea beetles), *Myzus persicae* (aphids), *Helicoveria zea* (Fruitworm), *Keiferia lycopersicella* (Pinworm), and *Autographa californica* (loopers).

Preparation of Leaves and seed extracts of plant (Neem)
The collection of neem plants leaves and seeds were dried

under shade. Simultaneously, preparation of alcoholic and ethyl acetate extracts. The Plant extracts was sprayed directly on the tomato crop infested with pests. Best effective plant extracts was selected for further trail in the field. Tomato seedlings were planted repeatedly, on large scale, in the experimental fields, during different seasons, to raise tomato crop. The experimental field was marked into several small plots of 5 X 5 m size. Out of these one will be used as a control plot, where the tomato plants are neither sprayed with plant extracts nor with any commercial insecticides. The magnitude of insect pests thriving on these tomato plants, serve as a reference or control to compare with the magnitude of insect pests present on other tomato plants after spraying with neem plant extracts.

The other plots were used as experimental plots where the tomato plants were sprayed with neem extracts. The intensity of pests present on these experimental plots after spraying with different plant extracts was assessed. This would aid us in checking the effect of neem extracts on controlling different tomato pests.

The experiment was repeated several times and the data should be collected.

Fig 1: Field View of Tomato Plants.

Result and Discussion

Table 1: Biological Evaluation of Tomato Pest after the Treatment of *Azadirachta indica* Plant Extracts

Tomato Pests / ***Azadirachta indica***	***Spodoptera exiava***	***Circulifer tenellus***	***Agrotis ipsilon***	***Epitrix nirtipemnis***	***Myzus persicae***	***Helicoveria zea***	***Keiferia lycopersicella***	***Autographa californica***
5% Leaves alco. Sol^{n}.	+	LA	-	-	+	+	+	+
5% seed alco. Sol^{n}.	+	+	+	+	LA	+	+	+
10% Leaves alco. Sol^{n}.	M	M	LA	LA	M	LA	LA	LA
10% seed alco. Sol^{n}.	M	M	IA	IA	M	IA	IA	IA

M- Mortality, LA- Less active, IA-Inactive, + Sign indicate the positive effect (dose & hours depended manner), - Sign indicate the non-effect

After the treatment with neem plant extracts on tomato pest results are shown in table I:I. The extracts of plants exerted maximum insecticidal activity. The plant selected *Azadirachta indica (V)* were fond to be very effective and showed 100% mortality or inactive the various pest of tomato after spraying 2 to 3 days was observed. This study indicates that the neem plant extracts effectively inhibited the tomato Pest. Table I:I showed the biological evaluation of tomato Pest after the treatment of neem plant extracts. The plant extract in 5% leaves alcoholic less affected when compared to 10% seeds extracts.

Yerima, et al. (2012) [12] reported that neem plant widely used as plant pesticides and more effective against fungi, viruses and insects. According to his study neem tree extracts has been used to control household pests, storage pests and crop pests of field. Neem has been produced as fumigant used as a pesticide and disinfectant in many countries on a commercial basis by farmers and agriculturists. This 100% natural product is nontoxic and environmentally friendly of these botanicals is the neem plant. Neem (leaf and seed) extracts have been found to have insecticidal properties, it is used as foliar spray. The Azadirachta seeds is quite high and adequate for efficient pest control and effectiveness against larval development (Mancebo, et al., 2002) [5].

Vegetable pest problem has become acute in recent years and due to pest vegetable yield was decrease. Chemical control of pest was not favored at present because of insecticides resistance among pests and environment imbalance created. Therefore alternative control method is needed. The use of plant extract should be promoted to reduce the toxic load of insecticides on the environment (Raja and Ignacimuthu, 2001) [9]. Application of chemical insecticides to control the pest resulting in problem like residual effects, pest resistance and toxicity to the component of the ecosystem, plant extracts could be effectively employed in pest control programs. Plant sources posses a wide range of pharmaceutical and insecticidal properties (Vinayagam, A. 2008) [11]. *Azadirachtin* has no side effect on birds and other animals (Martineau, 1994) [6]. The tree Azadirachta indica is easily grow and indigenous to India, it belongs to the family maliceae. All the parts of the neem tree used for medicinal purpose. Both seed and leaves are bitter taste having fungicidal, insecticidal and nematicidal properties (Orwa et al., 2009 and Hashmat et al., 2012) [8, 2].

Concussions

The need for steady and safe vegetable food supply to the population has led to the exploration of neem tree as a bio-pesticide. With the growing knowledge on the use of biopesticides it will gradually replace the conventional chemical pesticides presently in use. One of the problems with the use of chemical pesticides has been their impact on “non-target” species. Often they have been proven to be harmful to various beneficial species in the ecosystem. However, neem extracts are devoid of these effect

The proposed investigation was help in finding out alternate ways of controlling pests, with locally available wild plant extracts. This has been also help in bio-controlling of pests without harming the environment. This was help in production of low cost, environment friendly and effective Bio-pesticides which can be locally produced even by the end users (farmers) these bio-pesticides should be less harmful than conventional pesticides. They have cheap and effective in controlling agricultural pests and indicate that

plant extracts have great potential as an alternative strategy to pesticides for vegetable pests.

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