LITERATURE REVIEW

Mosquito is an important vector for transmitting diseases so controls of mosquitoes are necessary for health. Many people work done in this field.

Das et al. (2007) conclude from his study on mosquito larvicidal efficacy of plant extracts, the larvicidal activities of the plant extracts vary according to the plant species, the part of the plant, the geographical location where the plants were grown and the application method. Geyter et al. (2007) have been studied saponins possess clear insecticidal activities: they exert a strong and rapid-working action against a broad range of pest insects that is different from neurotoxicity. The most observed effects are increased mortality, lowered food intake, weight reduction, retardation in development and decreased reproduction. After these Bagavan et al. (2008) studied on the separation and identification of a saponin from Achyranthes aspera as a potential mosquito larvicidal compound with LC$_{50}$ value of 18.20 and 27.24ppm against Aedes aegypti and Culex quinquefasciatus respectively. This is the first report on the mosquito larvicidal activity of the saponin from the ethyl acetate extract of Achyranthes aspera and this study investigates the potential of crude extracts from commonly used medical herbs in India as an environmentally safe measure to control the vector of dengue and lymphatic filariasis.

Then Deore and Khadabadi (2009) have studies carried out to ascertain the larvicidal properties of Chlrophytum borivilianum santapau and Fernandes saponin extracts for the mosquito species Anopheles stephensi, Culex quinquefasciatus and Aedes aegypti. Methanolic extract, crude saponin extract and purified saponin fractions were used as test solutions. LC$_{50}$ and EC$_{50}$ values respectively were calculated. All extracts found to be larvicidal but pure saponin fractions was found more effective. After these Coelho et al. (2009) reported the effect of Moringa oelifera seed extract on development and survival of Aedes aegypti larvae. Ferreira et al. (2009) worked on Moringa oelifera and conclude that water extract of Moringa oelifera seed have thermostable biocompounds against Aedes aegypti larvae with apparent molecular mass lower than 12 kDa and moderately toxic potential.

Apart from that Kasolo et al. (2010) studied about the medicinal uses of Moringa oelifera leaves by local communities in Uganda and identified phytochemicals present in Moringa oelifera leaves extracts. It used quantitative and experimental methods that established the uses and identified phytochemicals in leaves. Twenty four medicinal uses of Moringa oelifera leaves were established. Phytochemicals present include: tannins, steroids, and
triterpenoids, flavonoids, saponins, anthroquinones, alkaloids and reducing sugars. Presence of phytochemicals in the extracts indicates possible preventive and curative property of *Moringa oelifera* leaves. Dande *et al.* (2010) studied the leaves of *Sesbania sesban* are rich in saponin content and evaluate the topical anti-inflammatory activity of the crude saponins by carrageenan induced rat paw edema method by preparing gel formulation.

Moreover, Arya *et al.* (2011) studied the mosquito larvicidal activity of saponin isolated from *Euphorbia hirta* have been tested against *Culex quinquefasciatus* by exposing II\textsuperscript{nd} and IV\textsuperscript{th} instar larvae to four different concentration of compound. It was noticed that IV\textsuperscript{th} instar larvae are more susceptible than II\textsuperscript{nd} instar larvae. The result obtained suggests that bioactive compound of *Euphorbia hirta* could be used in the search for new larvicidal compound of plant origin. Prabhu *et al.* (2011) have worked on the *Moringa oelifera* and conclude that phytochemicals derived Moringa oelifera seeds extracts are effective mosquito vector control agent against first to fourth instars larvae of *Anopheles stephensi* and the plant extracts may be used for further integrated pest management programme.

Recently, Shahriar *et al.* (2012) studied the preliminary phytochemicals screening of the crude extracts of *Moringa oelifera* leaves revealed the presence of different kind of chemical groups such as flavonoids, tannin, saponin, alkaloids, glycosides, carbohydrate and triterpenoids. Dried leaves of *Moringa oelifera* were subjected to brine shrimp lethality bioassay and the LC\textsubscript{50} values of methanol, ethanol, petroleum ether, n-hexane, and choloroform were found to be 0.747\textmu g/ml, 0.712\textmu g/ml, 1.632\textmu g/ml, 2.163\textmu g/ml and 0.633 \textmu g/ml respectively. The data obtained present study suggests that the extract of *Moringa oelifera* leaves have potent antioxidant activity against free radicals and significant cytotoxic activity.

Some work already done in my laboratory related to this as – Tonk *et al.* (2004) worked on larvicidal effect of *Artemisia annua* extracts on *Anopheles stephensi*. Then Singh *et al.* (2009) conclude that high concentration of *Ocimum sanctum* leaf extract can be used for preparation of mosquitoes repellent formulation without side effects. After these Soni *et al.* (2010) conclude that the extra cellular metabolites of *Chrysosporium keratinophilum* could be a fungal based larvicides resource for the control of *Culex quinquefasciatus* larvae.