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Ethnopharmacological Note

### Treating lymphatic filariasis with plants and cow urine – novel treatment method of a Bangladeshi folk medicinal practitioner

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Lymphatic filariasis (LF) is an infectious tropical disease caused by any one of several species of thread-like parasitic round worms like *Wuchereria bancrofti*, *Brugia timori* and *Brugia malayi*. The disease is spread by mosquitoes. The disease is also known as elephantiasis because it causes profound disfigurement of the body through lymphoedema, elephantiasis, and scrotal swellings leading to permanent disability. It has been mentioned that LF afflicts more than 250 million people in tropical countries and about 20 million people are afflicted with LF in twelve northern districts of Bangladesh (Saha and Mohanta, 2011). Three drugs are currently available for treatment, namely diethylcarbamazine, albendazole, and ivermectin; however, there has been development of resistance to these drugs (Cobo, 2016). As a result new drugs need to be discovered rapidly, more so because this disease is considered as a neglected tropical disease or NTD (Cheuka et al., 2016). Scientists have been examining plant-derived compounds for use against LF and among the various compounds tested diterpenes have shown promise (Barros de Alencar et al., 2017). A polyphenol enriched fraction of ethanol extract of *Azadirachta indica* leaves has been shown to cause apoptosis in the filarial vector *Setaria cervi* (Mukherjee et al., 2014). Ethanolic extract of the plant *Taxodium distichum* has been shown to demonstrate antifilarial activity (Kushwaha et al., 2016). Antifilarial activity of *Melaleuca cajuputi* flowers has also been reported (Al-Abd et al., 2016). Tribal medicine is an important element of the various traditional medicinal systems of Bangladesh. In previous ethnomedicinal surveys, we have observed that juice obtained from crushed whole plants of *Clitoria ternatea* (white variety flowers) are used by the Rai clan of the Tipra tribe of Sylhet district against filariasis (Nahar et al., 2013). A number of plants used by the folk and tribal medicinal practitioners of Bangladesh to treat elephantiasis have been reviewed (Rahman et al., 2013). These plants include *Abelia chinensis*, *Amorphophallus sylvaticus*, *Anthocephalus chinensis*, *Asparagus racemosus*, *Bombax ceiba*, *Brassica rapa*, *Caesalpinia nuga*, *Capsicum frutescens*, *Datura metel*, *Dioscorea bulbifera*, *Euphorbia antiquorum*, *Laportea crenulata*, *Lygodium flexuosum*, *Mimosa pudica*, and *Plumeria acutifolia*. In a recent survey in Nilphamari district where LF is common, we observed a folk medicinal practitioner (FMP) using a unique herbal formulation to treat LF. In his formulation, a paste made from leaves of *Polyalthia longifolia* (Sonn.) Thw. (Figure 1) (Family: Annonaceae, English: Mast tree, Bengali: Debbaru), roots of *Plumbago zeylanica* L. (Family: Plumbaginaceae, English: Ceylon leadwort, Bengali: Chitamul), and cow urine is slightly warmed and applied topically to swollen areas to cure LF. The plants were



identified unofficially by a botanist at the Bangladesh National Herbarium, and identities re-verified by a botanist at the University of Development Alternative. External application of *Plumbago zeylanica* root paste to filarial leg has been reported to be useful; paste made from roots of *P. zeylanica*, stem barks of *Erythroxylon monogymum*, and stem barks of *Moringa oleifera* in equal proportions in cow urine has been found useful to relieve edema of legs (which can be a feature of LF but also can arise from other factors), both ethnomedicinal applications being reported from various indigenous communities of Chittoor district, Andhra Pradesh, India (Chetty et al., 2006). Shade dried leaves of *Polyalthia longifolia* have been found to exhibit toxicity against the filarial vector, adult mosquitoes of *Culex quinquefasciatus* (Singha et al., 2013), but there appears to be no ethnomedicinal or therapeutic reports on efficacy of leaves in treatment of LF directly. Surprising as it may appear cow urine is considered a very effective medicine for numerous diseases and is used in India certainly from the introduction of Ayurveda. The manifold diseases that cow urine is used for treatment include diabetes, blood pressure, asthma, psoriasis, eczema, heart attack, blockage in arteries, fits, cancer, AIDS, piles, prostrate, arthritis, migraine, thyroid, ulcer, acidity, constipation, gynecological problems, and as a disinfectant (Mohanty et al., 2014). In Ayurveda, filariasis is known as Shleepada. In a famous Ayurvedic treatise Vangashena, it has been mentioned that taking cow urine with fruits of *Terminalia chebula* fried in castor oil can cure filariasis within a week (Ritesh et al., 2013). Thus the various ingredients used by the FMP of this study have reported uses for controlling filariasis or filarial vectors (mosquitoes) as individual components; the combination of the three ingredients is novel and needs further scientific investigation as to its efficacy. All three ingredients used by the FMC are commonly available in rural Bangladesh and are easily affordable.

**Keywords:** medicinal plants; filariasis; Bangladesh

### Declaration of Conflict of Interest

No conflict of interest associated with this work.

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Figure 1. *Polyalthia longifolia* (Sonn.) Thwaites