Short communication

**Aegle marmelos: A potential source of phytomedicine**

1M. Akram, 2Abdul Hamid, 1H. M. Asif

1Department of Eastern Medicine and Surgery, Faculty of Medical and Health Sciences, The University of Poonch, Rawalakot, AJ & K.

2Department of Horticulture, Faculty of Agriculture, The University of Poonch, Rawalakot, AJ & K.

Accepted 06 September 2012

**Aegle marmelos** has been used as antidiarrheal, antibacterial and antifungal agent in Unani system of medicine. The plant is highly used by the rural and tribal people for the treatment of diseases. However, despite its traditional usage as an antidiarrheal, antibacterial and antifungal agent, there is limited information regarding its uses in different diseases. The present article enumerates various traditional and medicinal uses of the plant and an attempt has been made to collect information about the medicinal and pharmacological activities of the **Aegle marmelos**

**Key words:** Aegle marmelos, medicinal activity, pharmacological activity of Aegle marmelos.

**INTRODUCTION**

**Aegle marmelos** has been used in Unani system of medicine for treatment of various ailments. Various active constituents have been isolated from this plant. Medicinal and pharmacological activities of this plant have been reported by some workers. A Bael fruit is mildly astringent and is used in India for dysentery and diarrhea; the pulp may be eaten or the decoction administered (Brijesh et al., 2009). It has a faint aromatic odor and mucilaginous taste. It is commonly cultivated. It occurs in the sub–Himalayan tract. It thrives in a fairly rich well drained soil (The wealth of India, 1948). Fruit of this plant has astringent and is used for treatment of dysentery (Shahab Uddin et al., 2005).

Objective of this study was to review the published literature on **Aegle marmelos**. For this purpose, relevant articles were searched using the terms **Aegle marmelos**, active constituents, medicinal and pharmacological activity.

**ACTIVE CONSTITUENTS**

Limonene (51.7%) and (Z)-β-ocimene (39.8%), 1,8-cineole (40.5%), α-phellandrene (34.5), (Z)-β-ocimene (5.1%), eight monoterpene hydrocarbons (92.8%), oxygenated monoterpenes (2.5%), sesquiterpene hydrocarbons (2.2%), oxygenated sesquiterpene (0.2%), phenolic compound, mucilage and pectin, coumarins, steroids, skimianinc, sterol, aegelin, marmorosin, imperatorin, Altoimperatorin, B sitosterol, psoralin, xanthotoxin, scopoletin and tembamide (Rastogi et al., 1993).

**Medicinal actions**

Lampronti et al. (2003) has studied the in vitro antiproliferate effects on human tumor cell lines of extract from the Bangladeshi medicinal plant **Aegle marmelos** Correa(Lampronti et al., 2003). Chauhan et al. (2007) has studied that administration of 50% ethanolic extract of **Aegle marmelos** cause suppression of fertility in male albino rats. The dried fruit does not contain the constituent’s requisite for the preparation of the decoction. **Aegle marmelos** has antioxidant and hepatoprotective activity (Khan et al., 2009). It is said to cure without creating any tendency to constipation. **Aegle marmelos** (L.) has antibacterial activity (Rastogi et al., 1993).

The decoction was assessed for its antibacterial, antiigiardial and antirotaviral activities (Rijamol et al., 2008). Kamalakkanan et al. (2007) has observed the
antihyperlipidaemic effect of Aegle marmelos fruit extract in Streptozotocin-induced diabetes in rats. Kamalakkannan et al. (2007) has also observed the hypoglycemic effect of water extracts of Aegle marmelos fruits in Streptozotocin diabetic rats. The decoction of the unripe fruit pulp of A. marmelos, despite having limited antimicrobial activity, affected the bacterial colonization to gut epithelium and production and action of certain enterotoxins (Joshi et al., 1952).

Vijaya et al. (2009) has studied the lipid lowering effect of Aegle marmelos. Arul et al. (2005) have studied the anti-inflammatory, antipyretic and analgesic properties of the leaves of Aegle marmelos. Badam et al. (2002) has evaluated the antiviral activity of Bael (Aegle marmelos Corr) upon human coxsackieviruses B1-B6. Costa-Lotulo et al. (2005) has evaluated the anticancer potential of Aegle marmelos.

Dhuley (2004) has investigated the gastroprotective and anti diarrhoeal properties of Aegle marmelos unripe fruit extract. Misra et al. (1991) has evaluated the antimalarial activity of traditional plant against erythrocyte stages of Plasmodium berghei. Sabu et al. (2004) has studied the antidiabetic activity of Aegle marmelos and its relationship with its antioxidant properties. Babbar et al. (2002) has reported antiviral activity.

Badam et al. (2002) has reported the in vitro antiviral activity of Bael (Aegle marmelos Corr) upon human coxsackieviruses B1-B6. Bandyopadhyay et al. (2002) has reported the gastroprotective effect of neem (Azadirachta indica) bark extract. Chakrabarti et al. (1960) has reported the hypoglycemic activity of green leaves of Aegle marmelos and piper nigrum. Kesari et al. (2006) has reported the hypoglycemic and antihyperglycemic activity of Aegle marmelos seed extract in normal and diabetic rats.

Samarasekera et al. (2001) has reported a new insecticidal protolimonoid from Aegle marmelos. Singh et al. (1983) has reported the antimicrobial and anthelmintic properties of the seeds of Aegle marmelos. Upadhya et al. (2002) has reported the hypoglycemic and antioxidant activity of Aegle marmelos in alloxan induced diabetic rats.

In vitro effect of Aegle marmelos on human sperm motility

A study was done to evaluate the anti-fertility potential of Aegle marmelos. Various concentrations of the ethanol extracts of leaves of A. marmelos were investigated for their in vitro effect on sperm motility. As a conclusion, it was found that the extracts had a considerable effect on the motility of sperm (Remya M et al, 2009). Sur et al, has reported the antispermaticogenic activity of leaves of Aegle marmelos, Corr. in albino rats (Sur et al, 1999). Pramanik et al has reported the effect of Aegle marmelos leaf on rat sperm motility (Pramanik et al, 2002).

PHARMACOLOGICAL ACTIVITY

The clinical study was conducted on Amoebin (Herbal coded cap.) that contains different medicinal herbs including Aegle mermelos, used as anti diarrhoeal drug in amoebic dysentery. Study was conducted in Shifa ul Muluk Memorial Hospital, Hamdard University, Karachi. Amoebin (Herbal coded cap.) was prescribed to 80 patients. The clinical efficacy of this drug was better than Entamizole that was prescribed to 63 patients. Clinical study of Aegel marmelos indicates that it exhibits the anti-amoebic effects. It was concluded that Amoebin is effective for the treatment Amoebiasis (Shahab Uddin, 2005).

In another study herbal drug Dirasif containing different medicinal herbs including Aegel marmelos was prescribed for treatment of secretory diarrhea. Clinical trials were conducted in Shifa ul Muluk Memorial Hospital, Hamdard University, Karachi. Herbal formulation Dirasif was given to 50 patients. Clinical study shows that Dirasif is effective for the treatment of secretory diarrhea (Asif et al, 2009). Jagetia et al. (2003) has reported the radioprotective activity of Aegle marmelos in cultured human peripheral blood lymphocytes exposed to different doses of gamma-radiation. Vijaya et al. (2012) has reported the antiproliferative and antioxidant activity of Aegle marmelos (Linn.) leaves in Dalton's Lymphoma Ascites transplanted mice. Rana et al. (2012) has reported the antifungal activity of Aegle marmelos.

CONCLUSION

The pharmacological activities as antifungal, antibacterial, hepatoprotective and for the treatment of amoebic dysentery and secretory diarrhea have been documented. Present review indicates that Aegle marmelos contains various phytoconstituents which reveals its uses for various therapeutic purposes.

REFERENCES


Badam L, Bedekar SS, Sonawane KB, Joshi SP (2002).


