



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPAS)**
'A Bridge Between Laboratory and Reader'

www.ijbpas.com

**VILWA-DHATRI – PRAKKARADI YOGA – AN AYURVEDA IMMUNE
MODULATOR FOR LATE NEONATAL PERIOD**

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Received 16th June 2021; Revised 11th July 2021; Accepted 25th Aug. 2021; Available online 25th Jan. 2022

<https://doi.org/10.31032/ijbpas/2022/11.1.2046>

ABSTRACT

Introduction: Arogya Raksha Kalpadruma (ARK) is an esteemed literary resource dealing with the Ayurveda paediatric care. Vaidya Sri Kaikulangara Ramavarrier from Kerala writes ARK. *Prakaradi Yoga* (PKY) is one of the chapters of ARK defining different immune modulator measures for a newborn baby up to 12th years of age. In this article one immunity improving PKY (*Vilva-Dhatri Yoga*) is described in detailed. **Material and Methods:** To discuss on the immune modulator activity of PKY (*Vilwa-Dhatri Yoga*) in neonatal health and to integrate it with today's modern paediatric practices. **Data Source:** Arogyaralksha Kalpa druma, Nighantu Grnhas and online searches for research on Viwa and Dhatri. **Review Methods:** Data on the *Vilwa* and *Dhatri* has been reviewed from all possible Ayurveda Texts, also the different research articles on Viwa and Dhatri from all scientific indexed journal research papers, Pubchem and other authenticated data bases has been

reviewed, analysed, discussed and concluded. **Conclusion:** This PKY drugs have hepato-protective, immune modulator, rejuvenation and cyto-protective and antioxidant properties which are helpful for prevention of neonatal diseases like pathological jaundice and neonatal sepsis etc and promoting the healthy growth and development of newborn.

Keywords: *Arogya Raksha Kalpadruma, Immune modulator, Neonate, Pakshatheetha, Praakara, Vyadhikshamatva, Vilva-Dhatri Yoga*

INTRODUCTION:

Ayurveda is one of the oldest branches of medicine originated in India 5000 years ago. It provides complete knowledge about one's health, various etiological factors that affect and the different ways of treatment. "Kaumarabhrthy" is the branch of Ashtanga Ayurveda dealing with *Balaroga* and its treatment. Acharya Kashyapa defines Kaumarabhritya as primary branch among all eight branches.¹ *Kaumarabhrthy* narrates the different aspect of pediatric like, growth rearing and treatment of different diseases of children²³.

Arogya-Raksha Kalpadruma (ARK) is an important literary resource dealing with the pediatric care. This book has been compiled by a great scholar named Vaidya Sri Kaikulangara Ramavarrier who lived in Kerala in the last century. This literary resource is the one and only leading light in the ancient Kerala tradition in the ancient paediatric care. This work is considered as the valid source of Ayurvedic care of children. This book contains some immunomodulatory measures under the

chapter "Prakkaradi Yoga". *Prakkara Yoga* (PY) is the 35th chapter of the "ARK". The author, at the end of the chapter points out that the content of PY is advised by Acharya Bhela. The core content of the chapter is the indigenous practices for enhancing body immunity and to prevent diseases in children. Due to vitiation of Dosha, variety of diseases is occurring to children. Like the fort prevents the attack of enemies, PY help to prevent the occurrence of disease. In this article one PY (*Vilva-Dhatri Yoga* [VDY]) which is given⁴ for those babies who completed 15 days of life (*Pakshatheetha*).

This VDY contains *Panchangas* of *Vilwa* (*Aegle marmelos*) with juice of *Amalaki* fruit (Indian gooseberry) and it should be given for 7 continuous days in morning and it will prevent the occurrence of different disease in baby. For *Pakshateeta* (15 days to 1 month old baby): -the root, bark, leaf, flower and fruit of *Vilwa* are taken together and powdered well and this powder is added with the juice of *Dhatri* (*Embellica officinalis*) and given

internally to the infant for 7 continuous days (14th day to 21th).⁵

VILWA

The *Aegle marmelos* is commonly known as *Bael* in most part of India and commonly used as holy plant in worship of Lord Shiva. It belongs to the Rutaceae family⁶.

Ayurveda Rasapanchaka of Vilwa:

- ✓ *Rasa: Kashaya* (Astringent), *Tikta* (Bitter), *Katu* (Pungent), *Katu* (pungent). astringent is the predominant Rasa
- ✓ *Guna* (qualities): *Guru* (Heavy), *Ruksha* (Dry), *Ushna* (hot)
- ✓ *Veerya* (nature): *Ushna* (Hot)
- ✓ *Vipaka* (taste developed through digestion): *Katu* (pungent)
- ✓ *Doshaghната* (effect on humors): *Tridoshashamak* (Alleviate all the Three *Dosha*, it alleviates all three *Dohsa*)

Botanical description

It is *Khsupa* (medium height Plant) as per Ayurveda⁷. The leaves are trifoliate, contains 3-5 leaflets. The flower of *Bael* is of a greenish-white colour. Having a sweet scent, it also characterizes as having bisexual, ebracteate, hypogynous, actinomorphic stalk. The leaf axil holds some lateral panicles which contain multiple flowers^{8,9}.

Phytochemicals in vilwa

Vilwa contains large number of polyphenols as well as flavonoids. The fruit pulp, fruit juice has been reported to be rich in numerous health-boosting polyphenols. Alkaloids, flavonoids, phenolic compounds, terpenoids have been accumulated in *Bael* pulp. The most important polyphenols and flavonoids present in *Vilwa* depend on the maturity stage of *Vilwa Phala*¹⁰.

Table 1: Chemical constituents of *Vilwa*

S. No.	Plant part	Chemical Constituents
1	Leaf	Skimmianine, Aeglin, Rutin, gamma-sitosterol, beta-sitosterol, Flavone, Lupeol, Cineol, Citral, Glycoside, O-iso-pentenyl, Hallordiol, Mameline, Citronellal, Cuuminaldehyde, phenyl ethyl cinnamide, Euginol, Marmesinin, Aegelin, Glycoside ¹¹
2	Fruit	Marmelosin, Luvagetin, Aurapten, Psoralen, Marmelide, Tannin, Phenol
3	Bark	Fagarine, Marmin, Furoquinolin, Alkaloids
4	Seed	Essential oil- D- limonene, A-D – phellandrene, Cineol, citronellal, Citral, P-m cymene, Cumin aldehyde
5	Root	Alkaloid, Halopine, Coumarins, Terpinens

The fruit extract of *Bael* is also used to improve the immune system that will finally increase the anticancer activity of the body.

Cardio-protective effect

Methanolic *bael* root extract can reduce up to 50% of the heartbeat rate^{12,13}. *Bael* extract proves to be better than digoxin in clinical researches¹⁴. Different phytochemicals (terpenoids, tannins,

flavonoids) present in Bael have the ability to protect the heart from isoproterenol promoted myocardial infarction in some animal model¹⁵.

Antipyretic or anti-inflammatory activity

The presence of lupeol, citral, skimmianine act as anti-inflammatory agents. The antipyretic effect of Bael has been seen in different animal studies¹⁶. Bael in vivo showed actions like anti-inflammatory, mast cell stabilization, and antioxidant along with superoxide dismutase increase and malondialdehyde level decrease which gives protection for degranulation in mast cells¹⁷. The bark of the Bael tree root showed a strong anti-inflammatory action in different animal studies^{18,19,20}

Hepatoprotective activity

The bael leave extract shows remarkable hepatotoxicity²¹. In one of the research study (T.H Khan et al) showed lowering of lipoprotein X (LPx), xanthine oxidase as well as serum toxicity marker enzymes (SGOT, LDH, SGPT) have also released which is an indication of the hepatoprotective action of Bael²². Research study (M.S. Baliga et al.) showed the significant hepatoprotective potential of Vilwa and results in the biomarker like SGPT, ALP and bilirubine²³

Immunomodulatory effect

Animal study by Y. Shivhare et al showed the good effect in improving the humoral immunity along with changes in the neutrophil count in Wistar albino rats²⁴.

Table 2: Pharmacological uses of *Vilwa*

S. No.	Part	Pharmacological use
1	Leaves	Anti-inflammatory, ulcer, asthma, cold and respiratory infection, beriberi, nervous disorder
2	Root bark	Intermittent fever, gastric troubles
3	Flower	Stomach tonic, anti-diabetic, epilepsy
4	Fruit	Dysentery, constipation, brain and heart tonic, ulcer, antiviral
5	Seed	Antibacterial, antifungal

DHATRI

Morphology²⁵

Dhatri is well known as Amalaki in Ayurveda Classics and having wide range of therapeutic uses in multiple diseases. It is Kshupa and found across the India as wild as well as cultivated plant.

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Taxonomical Position²⁶: *Emblica officinalis* Gaertn. Syn. *Phyllanthus emblica* Linn.

Rasapanchaka (Ayurvedic pharmacodynamics)²⁷

✓ *Rasa*: *Amla* (Sour), *Kashaya* (Astringent), *Tikta* (Bitter), *Katu* (Pungent), *Madhura* (Sweet). Sour and astringent are the predominant

- Rasa, but the fruit has five tastes, including sweet, bitter, and pungent
- ✓ *Guna* (qualities): *Guru* (Heavy), *Ruksha* (Dry), *Sheeta* (Cold)
 - ✓ *Veerya* (nature): *Sheeta* (Cold)
 - ✓ *Vipaka* (taste developed through digestion): *Madhur* (Sweet)
 - ✓ *Doshaghnata* (effect on humors): *Tridoshashamak* (Alleviate all the Three *Dosha*, it alleviates all three

✓ *Doshas: Vata, Pitta, Kapha*, and is especially effective for *Pitta Dosha*. *Amalaki* has been considered the best of the *Ayurvedic* herb to Rejuvenate herb and used as *Rasayana*.

The fruit pulp contains:²⁸

Table 3: Contents of *Amalaki* fruit

S. No.	Components	Percentage
1	Moisture	81.2%
2	Protein	0.5%
3	Fat	0.1%
4	Mineral matter	0.7%
5	Fiber	3.4%
6	Carbohydrate	14.1%
7	Calcium	0.05%
8	Phosphorus	0.02%
9	Iron	1,2 mg/100gm
10	Nicotinic acid	0.2mg/100gm
11	Vitamin C	600mg/100gm

Active roles of *Embllica officinalis*

Cardio protective: The fresh juice of *E. officinalis* fruit which is rich in Embalicanin-A and -B is helpful to prevent the ischemia-reperfusion-induced oxidative stress in rat heart. The fruits are having cardio protective effect. It is having antioxidant property and reduces the stress and prevents the hypertension and hyperlipidemia as proven in Studies by Yokozawa et al.²⁹

Hepato protective: *Amalaki* has been proved in protection against a wide variety of hepatotoxic agents, such as heavy metals ethanol, paracetamol, carbon tetrachloride, ochratoxins, hexachlorocyclohexane and

antitubercular drugs. Ingredients of *Amalaki* like phytochemicals, gallic acid, ellagic acid, quercetin and corillagin, possess hepatoprotective activity³⁰

Against carcinogenesis: A pre-clinical study by Zhao et al. shows wide range of antineoplastic effect in numerous cancer cell lines from multiple tissue types like colon cancer, hepatocyte carcinoma, pancreatic cell carcinoma, breast cell cancer etc.³¹

Immunomodulator and Cytoprotective: It has been demonstrated that extracts of *E. officinalis* fruit have significant immunomodulatory immunostimulant action and cytoprotective action.^{32,33}

Anti-inflammatory and antipyretic: The contents like tannins, alkaloids, phenolic compounds, amino acids and carbohydrates are proved to be having antipyretic effect. Extracts of *Emblica officinalis* fruits possess potent antipyretic and analgesic activities³⁴

Antibacterial activity: Amalaki has also possess the antimicrobial activities against *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Escherichia coli*, *K. ozaenae*, *S. paratyphi*³⁵

Antioxidant: Amalaki fruit is a rich source of vitamin C a good source of antioxidant. Tannins like embelicanin-A (37%), emblicanin-b (33%), punigluconin and pedunculagin conjointly give protection against Oxygen radical enclosed hemolysis of rat peripheral blood erythrocytes³⁶

DISCUSSION

An immunomodulator can be defined as a substance, which can influence any constituent or function of the immune system in a specific or non-specific manner including both innate and adaptive arms of the immune response³⁷. Ayurveda described the concept of immunity under the term “*Vyadhikshamatwa*”³⁸. Acharya Chakrapanidatta has interpreted the term *Vyadhi-Kshamatwa* as *Vyadhi bala Virodhitwa* i.e., antagonistic to the strength and virulence of the disease and

Vyadhyutpada Pratibandhakatwa i.e., the ability to inhibit the causes and factors of the disease³⁹ The Ayurvedic system of medicine details the concept of immunomodulation by the term *Rasayana*. Such herbs possessing immunomodulatory effects are referred to as *Rasayana* in Ayurvedic classics. PKY is an indigenous method of enhancing body immunity, which is narrated only in the text *Arogyaraksha Kalpadruma*. It protects the children from the disease just as *Prakkara* (fence) protects a house from enemies. In this, the drug schedule starts with birth and continues up to the age of 12 years⁴⁰. The drug combinations detailed are as per the age of the child. It is advisable to consume each formulation along with a suitable adjuvant, for seven consecutive days in a dose varying with corresponding age. In this paraakara yoga a child of 15 days should be administered the powder of *Panchanga* of *Bilwa* (*Aegle marmelos* (L.) *Correa*) with *Amalaki Swarasa* (*Phyllanthus emblica* Linn.) for seven days. It has been said that the PKY prevents the child from disease as like shatru in terms by developing immunity.

Due to vitiation of Dosha variety of disease are occurring to children due to various reasons. For the prevention the occurrence of such childhood disease, the

medicaments formulated in PKY with age wise.⁴¹ Newborn of age of 15 days to 1 month should be administered with the *Vilwa Panchanga* powder mixed with *Amalaki Swarasa* (Indian gooseberry fruit juice). It will balance the doshas and increase child's immunity and protect him/her from diseases

In modern pediatric the early 28 days of life are considered as neonatal period, however the neonatal period is subdivided into early neonatal period (first week of life) and late neonatal period (8th day to 28th day of life). The age classification is based on the immaturity of the internal organs and cellular functions of newborn. Considering this differs in childhood physiology and anatomy there is differing in the treatment of child at different ages. During this time immaturity of the cells and organs is the main factors to be taken into consideration and hence there is definite role of the immune

modulators and rejuvenation in neonatal period. Different combination of drugs having rejuvenation property to reduce the oxidative stress and to offer the cells to perform healthier and optimum function is mentioned as PKY. In addition, there is pathological jaundice in late neonatal period due to immaturity of liver cells, also there is increased chance of neonatal sepsis due to low immunity of neonates, hence drugs with hepato-protective, immune modulator, rejuvenation, anti-oxidant and cytoprotective, antimicrobial property has additional role in protecting the neonate from age specific diseases. As *Vilwa* and *Dhatri* are such plant with such anti-oxidant and rejuvenation property which promotes the health of newborn, this PKY (VDY) is very special Yoga to promote the health of newborn and all Ayurveda pediatricians should encourage the use of this Yoga in clinical practice.

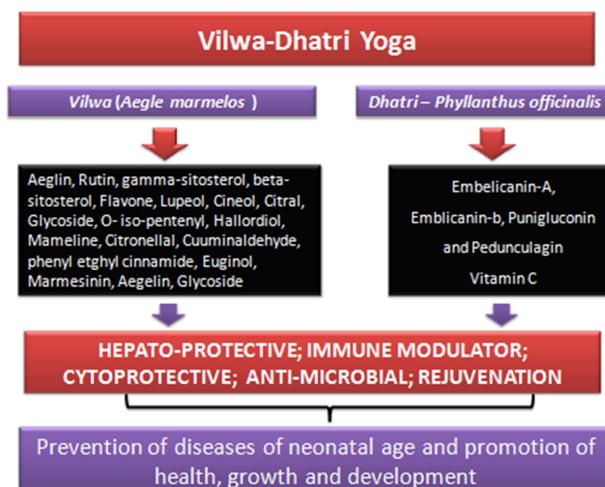


Figure No.1: VDY at a Glance

CONCLUSION

Thus, this yoga which mentioned in PKY can be practised as an effective preventive measure for the child for early infantile age. This is key message to

modern health world to highlight the traditional immune modulators in Ayurveda and to integrate it with today's modern paediatrics.

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