

**ANTIBIOTICS RESISTANCE! WHAT CAN AYURVEDA DO?**

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Article Received on
23 Nov. 2018,

Revised on 13 Dec. 2018,
Accepted on 02 Jan. 2019

DOI: 10.20959/wjpps20192-13011

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ABSTRACT

A Bacterium is a unicellular micro organism that does not have a nucleus or any other membrane bound organelles. Bacteria play an important role in our life. They show good as well as harmful activities like they digest nutrients, synthesizing vitamins, help in degrading of dead organisms, bring valuable nutrients back to earth and also spread many diseases like cholera, typhoid, dysentery, pneumonia, tuberculosis, tetanus, ring disease of potato, citrus canker and yellowing rot of wheat etc. Antibiotics are a type of drugs which used

in treatment and prevention of bacterial infections. The first true antibiotic penicillin was discovered by Alexander Fleming in 1928. Discovery of penicillin create a landmark in field of medicine. But as the time passed, resistance against bacteria developed due to excessive use and misuse of antibiotics. Today it's required to choose alternatives of antibiotics. The *Ayurvedic* approach against bacteria is best alternative of antibiotics. Many *Ayurvedic* plants like *Nimb*, *Amalaki*, *Tulsi*, *Madhuyasthi*, *Kasmard*, *Daruharidra*, *Lavang*, *Rasona*, etc. show significant antibacterial activity. Mainly *tikta* and *kashaya rasa pradhana dravya* have antibacterial property.

KEYWORDS: Antibiotic, *Ayurveda*, Bacteria, Cholera, Penicillin, Tuberculosis, Pneumonia, Tetanus.

INTRODUCTION

Ayurveda emphasizes on body immunity rather than causative organism in pathogenesis of diseases. *Acharya Charak* described *vayu*, *jala*, *desh* and *kaal vikriti lakhsans* in

janapadodhwans which results in weak immunity and development of diseases.^[1] *Maharishi Sushruta* described infectious diseases as *sansargaja vyadhi*, he told many *aushadhi* Viz. – *tila-kalka*, *madhu*, *goghrita*^[2], *twaka* of many *panchvalkal* plants, *Varnashodhak* and *Varnaropak gana* (*Aragvadhadi gana*, *Arkadi gana*, *Sursadi gana*, *priyangawadi gana*, *Ambasthadi gana* and *Nyogradhadi gana*, *lakshadi gana*^[3]) to prevent and heal the infection of surgical wounds. He advised *varnaprakshalana* (wound wash) with *kashayajala* (decoction) and fumigates the wound with fumes of *guggulu*, *vacha*, *raal*, *sweta sarso churna*, *agar*, *lavana*, *nimbpatra* and *kustha* etc. with *ghrita*. *Bhavprakash* described *karpooradi varga* which mainly contains *tikta rasa yukta* aromatic *dravya* Viz. - *karpoor*, *chandan*, *guggulu* and *lavang* etc. which acts on skin diseases, abscess, uterine and urinary disorders etc.^[4] *Acharya Yogratanakar* told about *krimichikitsa* he describes many drugs for *krimi chikitsa* like *kriminashak dhup*, *vishala dhup*, *vidangadi taila*, *krimimudgar rasa*, *krimikuthar rasa* etc.^[5]

In *bhaisajyaratnawali* author described many *kriminashak yoga* for *kriminashan* like *mustakadikwath*, *palashbeej prayoga*, *khajoorpatra kwath*, *vidanygadiyavagu*, *bimbighrita*, *yawani churna*, *kampillak churna*, *Vidanga-loham*.^[6]

Homa is used in purification of the atmosphere. When aromatic medicinal herbs poured on burning Fire, it prevents growth of pathogenic bacteria and can stop infectious disease on large scale. It make anaerobic environment which destroy mainly aerobic bacteria. It is also said that sun-rays during the sunrise and sunset has germicidal effect due to presence of ultraviolet rays.

Acharya charak described *krimighana mahakashayaya* which under he described *akshiva*, *marich*, *gandira*, *kebuk*, *vayavidanga*, *sindhuvar*, *kinnihi*, *gokhuru*, *vrishaparnika*, *mushakrnni*. etc.^[7] There are many plants described in *Ayurveda* which have specific antibiotic properties viz.-

Nimb (Azadirachta indica A. Juss.) - *Nimb* can be said to be a most commonly used *ayurvedic* antibiotic for its versatile usability in the treatment of a number of bacterial infections. It destroys the bacteria, stimulates the immune system and encourages rapid healing. Treat ear boils, eczema, ringworms and other skin diseases. Its oil shows antiseptic and antifungal properties. Aqueous extracts of its leaf, bark and seeds shows antibacterial

activity against *E. coli* and *S. aureus*.^[8] Nimbidin and nimbolide from seed oil show antimicrobial activity against *Mycobacterium tuberculosis*.

Tulsi (*ocimum sanctum Linn.*) - In India has been known as *mata* i.e. mother. It has nearly 80% of antibiotic properties. Used in treating skin disorders, ringworms and respiratory tract problems. Oil obtained from its leaves shows activity against *S. aureus* and *E. coli*.^[9]

Lavang (*Syzygium aromaticum Linn.*) - It shows antibacterial, antifungal and antiseptic properties. Its extract stopped the growth of *P. aeruginosa* and *C. albicans*.^[10] its oil used in dental diseases since ancient time because it is very effective against toothache, sore gums, halitosis and mouth ulcers.

Rasona (*Allium sativum Linn.*) - Its alkaloid Allicin shows antibacterial activity against a wide range of Gram negative and Gram positive bacteria.^[11] It was used as first-aid in battlefields to avert infection in wound. Garlic reduces fetidity in pulmonary gangrene and relieves tuberculosis. It acts as anti-septic and relieves inflammations and infections of the intestines and stomach. It enhances the flora in the intestine to prevent infection by harmful bacteria. Chewing garlic cloves relieves infected mucosal membrane, decreases temperature and provides relief in Diphtheria.

Haridra (*Curcuma longa Linn.*) - Used as an antiseptic on skin, considered to be best antihelminthic drug. Curcumin shows activity against various bacteria (*E. coli* and *S. aureus*), viruses and parasites.

Daruharidra (*Berberis aristata Dc.*) - It is used in eye disorders since ancient time. Its extract shows activity against eye infecting bacteria viz.-*P. aeruginosa*, *S. aureus*^[12] etc. It is used topically as antiseptic for quick healing of wound and ear discharges. In females it is used to cure uterine infections. Decoction of this herb is used in the form of gargles in throat infections.

Amalaki (*Phyllanthus Emblica Linn.*) - Described as best immune enhancing drug in *Ayurveda* because of richness of vitamin C. it is also useful in recurrent respiratory tract infections such as tonsillitis, sinusitis and sore throat. Constitutes of *Amalaki* have been found to be active against a range of organisms including *Staph. aureus*, *E. coli*, *C. albicans*, *Mycobacterium tuberculi* and *Staph. typhosa*.

Kasmard (*Cassia occidentalis Linn.*) - The leaves and seed pastes are applied over skin lesions, herpes, ulcers, ring worm and tinea infection. The volatile oil obtained from the leaves, roots and seeds showed anti-fungal and anti-bacterial activity. The plant is used to cure sore eyes, typhoid and leprosy. Its excellent response was recorded in senile pruritus cases.

Honey – It contains antibacterial and antioxidant properties. Honey heals ulcers, burns and wounds on application.

Goghrita- It has been used from centuries to improve physical and mental health. It is used to heal wounds, burns and ulcers. It is antibacterial and antimicrobial agent. It is mainly used in disease of female reproductive system.

Bilva (*Aegle marmelos L.*)- It acts against *V. cholera*, *E. coli* and *shigella sp.*^[13]

Yavani (*Trachyspermum ammi Linn.*) - Methanol extract of the plant shows great effect on the gram positive and gram negative microbes such as on multi-drug resistant *Salmonella typhi*. Thymol chemical present in the plant tends to inhibit the activity of the microbes. It acts against *S. aureus* and *P. aeruginosa*.

Haritaki (*Terminalia chebula Retz.*) - It has antibacterial properties which make it very effective for treating Vaginal and Urinary tract infections. It acts against *S. typhi*, *B.subtilis* and *S. epidermidis*.^[14] Dried *haritaki* fruit has strong antibacterial properties for preventing infection from bacteria in the food we eat.

Hingu (*Ferula asafetida Linn.*) – It is an antibacterial against *B. subtilis*, *E. coli* and *S. typhi*.^[15] It is good in checking the growth of microorganisms in the stomach, thereby helpful in prevention of gastritis, constipation and flatulence.

Compound name	mild activity	Moderate activity	Strong activity
<i>Triphala churna</i>	<i>K. pneumonia, bacillus subtilis.</i>	<i>Proteus vulgaris, S.typhi</i>	<i>S. epidermidis, S. aureus</i>
<i>Hareetaki churna</i>	<i>E. aerogenes, E. coli.</i>	<i>B. subtilis, P.aeruginosa</i>	<i>S. epidermidis, S. aureus,</i>

Certain studies show that following compounds show antibacterial property against specific bacteria -

Compound	Bacteria
<i>Mahasudrashan churna</i>	<i>S. aureus, S. typhosa</i>
<i>Ajmodadi churna</i>	<i>S. typhi, E. coli</i>
<i>Pipalimool churna</i>	<i>E. coli, B. subtilis</i>
<i>Dashmula churna</i>	<i>S. typhi, B. subtilis.</i> ^[16]

CONCLUSION

As described in this article various *ayurvedic* herbs and preparations shows antimicrobial activity against several bacteria's. These medicines are used as both ways topically and internally. Herbs are used in cooking, tea, as a tincture, *churna*, *ghrita*, oil and simply added to diet.

Development of antibiotic resistance is a serious worldwide problem. Today we have an urgent requirement of natural products which can act as an effective antibiotic without any side effects. *Ayurveda* never given preference to antibiotics, rather it always gives attention on boosting the immunity. In *Ayurvedic* literatures there is a description of *Rasayanas*, yogic exercises, meditation, daily regimen which improves immunity and prevents occurrence of diseases. At this point we conclude that proper use of modern antibiotics along with herbal drugs can check their resistance and improve the quality of treatment.

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