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Ayurveda- An Invocation to Boost Immunity and the Fight Against COVID-19

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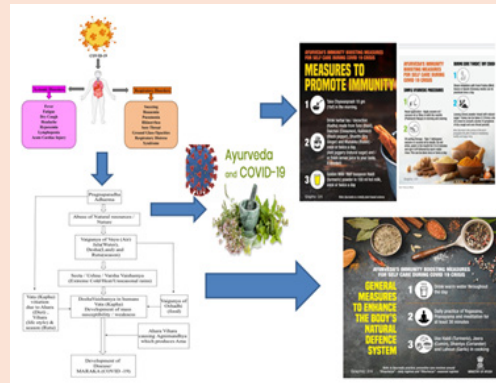
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ABSTRACT

The COVID-19 pandemic is a world challenge as the cases are increasing every day. The disease has overwhelmed healthcare system across the world. This scenario calls for fresh approaches for public health and disease management. Traditional Indian medicine has a lot to offer in the management of COVID-19, and therefore it is a very appropriate time for Ayurveda to develop a protocol approach for the management of COVID-19 and prophylaxis and protection of vulnerable organs involved in viral entry. The approach of Ayurveda on strengthening host defense through boosting the immunity may be useful as effective, safer, accessible and affordable prophylaxis of COVID-19.

KEYWORDS Pandemic, COVID-19, Ayurveda, Protocol, Immunity.

PICTORIAL ABSTRACT



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1. INTRODUCTION

COVID-19 (corona virus disease 2019) is an infectious disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), previously known as the 2019 novel corona virus (2019-nCoV), a strain of corona virus. The first cases were seen in Wuhan, China, in late December 2019 before spreading globally.^[1,2] The current outbreak was officially recognized as a pandemic on 11 March 2020.^[3]

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. The incubation period for COVID-19 was initially calculated to be ~5 days, which was based on 10 patients only.^[4] An American group performed an epidemiological analysis of 181 cases, for which days of

exposure and symptom onset could be estimated accurately. They calculated a median incubation period of 5.1 days that 97.5% became symptomatic within 11.5 days (CI, 8.2 to 15.6 days) of being infected, and that extending the cohort to the 99th percentile results in almost all cases developing symptoms in 14 days after exposure to SARS-CoV-2.^[5]

Enhancing the body's natural defense system (immunity) plays an important role in maintaining optimum health. We all know that prevention is better than cure. While there is no medicine for COVID-19 as of now, it will be good to take preventive measures which boost the immunity in these times through Ayurveda. COVID-19 may be treated with Ayurveda, but in the absence of scientific validation the ancient Indian medicinal stream has only been used as a preventive measure during the current crisis. We have been asked for scientific validation for the Ayurvedic formula. It is a stream of medicine that has been passed on from one generation to other. Notwithstanding the fact that no system of medicine has

any evidence-based treatment for COVID-19 as yet, clinical interventions are being done worldwide. Similar strategy is required to be implemented by Ayurveda system of medicine. Ayurveda interventions become even more relevant by the fact that there is an elaborate description of causation and management of epidemics (*Janapadodhwamsa*).^[6] Corona virus encroaches the immune system. Boosting the immune system will cause repulsion of virus. It primarily affects respiratory system. Ayurveda offers the solution to improve the strength of respiratory system. Most of the damage in COVID-19 disease is caused by the derangement of immune system. Millions of cells affected by virus tend to burst, ultimately causing extensive damage to the lung tissue, acute liver injury, acute cardiac injury, several organ failure, this leads to shortness of breath, dry cough, and other complications and may lead to mortality in some cases.

This is the time to mainstreaming the AYUSH systems to transform Indian healthcare^[7] and demonstrate the potential of AYUSH systems in addressing the challenge and restoring health.^[8]

2. CLINICAL PRESENTATION

About 80% of COVID-19 cases present with mild symptoms requiring only primary medical care. Of the rest 20% cases 15% require urgent medical attention at secondary health care services. Remaining 5% are critical cases requiring an intensive care and hence require a transfer to tertiary health care units equipped with ICU.^[9] COVID-19 typically presents with systemic and/or respiratory manifestations.^[10] The disease progression is gradual, and requires about 9-10 days to progress from symptoms of Upper Respiratory Tract Infection (URTI) to Acute Respiratory Distress Syndrome (ARDS). ARDS often is followed by un-correctable hypotensive shock, multi-organ failure and eventually death.^[11] Some individuals infected with SARS-CoV-2 are asymptomatic and can act as carriers.^[12] Some also experience mild gastrointestinal or cardiovascular symptoms, although these are much less common.^[13,14] Few Common symptoms are fever (85-90%), cough (65-70%), fatigue (35-40%), sputum production (30-35%), shortness of breath (15-20%) and some less common symptoms are myalgia / arthralgia (10-15%), headaches (10-36%), sore throat (10-15%), chills (10-12%) and pleuritic pain.

3. PATHOPHYSIOLOGY

The SARS-CoV-2 virus, like the closely-related MERS and SARS corona viruses, affects its cellular entry via attachment of its virion spike protein (a.k.a. S protein) to the angiotensin-converting enzyme 2 (ACE 2) receptor. This receptor is commonly found on alveolar cells of the lung epithelium, underlying the development of respiratory symptoms as the commonest presentation of COVID-19. It is thought that the mediation of the less common cardiovascular effects is also via the same ACE-2 receptor, which is also commonly expressed on the cells of the cardiovascular system.^[15]

3.1 Hypothetical *Samprapti* (Etiopathogenesis) of COVID-19

3.1.1 Doshha: Predominantly *Kapha*, with both *Vata* and *Pitta* secondarily affected to varying degrees

3.1.2 Dushya: *Rasa dhatu* (blood plasma). This tissue is disturbed in all febrile conditions.

3.1.3 Agni: *Mandagni*

3.1.4 Ama: *Samaroga* affecting macro digestion and cellular metabolism

3.1.5 Srotas involvement: *Pranavahasrota* (respiratory passages), *rasavahasrota* (blood plasma)

3.1.6 Srotodushtiprakara: *Sanga* (obstruction), *atipravritti* (excessive flow)

3.1.7 Sthana: *Udbhavasthana* (upper region), *agantuja* (external factor)

3.1.8 Vyakta: Manifests in the upper body primarily in *Kapha* regions (lungs, sinuses, stomach, heart, blood, joints)

Fever associated with covid-19 is known to be Kaphapradhan (*Kapha* dominant). Vitiated *Kapha* along with *Ama* (toxins) blocks various *Naadi's* (channels) in the body which then vitiate *Vata* and *Pitta* too. This results in the spread of *agni* (fire) throughout the body, pushing heat towards the skin and raise body temperature. Respiratory illness accompanied by dehydration, shortness of breath and blockage is because of more vitiated *vata* and the obstruction of *kapha* blocks the *pranavahasrotas* (respiratory passage) which leads to *swaskrichta* and vitiated *kapha* accumulates in the lungs which leads to other associated symptoms. Ayurvedic treatment aims at reduction of *kaphadoshas* and removal of *Ama* from the body to promote healing and alleviate symptoms.

4. RISK FACTORS FOR SEVERE ILLNESS OR POOR OUTCOME^[15,16]

4.1 General

- 4.1.1 Old age
- 4.1.2 People in a long-term care facility
- 4.1.3 Male gender
- 4.1.4 Children

4.2 Co morbidities

- 4.2.1 Cardiovascular disease
- 4.2.2 Diabetes mellitus
- 4.2.3 Hypertension
- 4.2.4 Chronic respiratory disease, e.g. COPD
- 4.2.5 Cancer
- 4.2.6 Immunosuppression

5. A VIEW OF COVID-19 THROUGH AYURVEDA

In Ayurvedic Classics, Acharya Sushruta has mentioned about *Aupasargic Rogas* i.e communicable and contagious diseases in which it has been said that it can be transmitted by touch or breath, or through sharing of the same bed, and eating and drinking out of the same vessel with him, or through using the wearing apparel, unguents and garlands of flowers

previously used by a person afflicted with this dreadful disease.^[17] Ayurveda though being an ancient life science clearly mentions about such disease conditions. A detailed chapter on *Janapadodhmanas* in Charak Samhita Vimansthana 3rd Adhyay explains epidemic disease and its etiological factors.^[18] The CDC (Center for Disease Control and Prevention) says that the transmissions of corona viruses in humans are most commonly spread between an infected person and others via:

- 5.1 The air (from viral particles from a cough or sneeze);
- 5.2 Close personal contact (touching or shaking hands);
- 5.3 An object or surface with viral particles on it (then touching your mouth, nose or eyes before washing your hands)

In Ayurveda the Srotas also acts as one of the important factors in (~pathogenesis of diseases), as it is said that diseases are caused because of the obstruction in the Srotas. This pranavahasrotas gets vitiated because of various reasons like Raja (dust particles which are visible or may not be visible, containing viruses), Dhuma (smoke containing air pollutants) shitassthana (cold Environment). This Raja when enters through mouth and nose develops disease like Kasa (cough), Hikka (hiccups), Shwas (Breathing problems like cough or throat irritation), Pratishaya (Running or stuffy nose) which are similar to corona virus.

6. AYURVEDA APPROACH AGAINST COVID-19

Natural herbal medicine (NHM) has been used to control infectious diseases for thousands of years. It benefits as a supplementary treatment of SARS or SARS-like infectious disease. Since the virus infection leads to respiratory ailments, we have to strengthen our immune system to fight against the respiratory ailments. Ayurveda terms respiratory illness as '*Svasarogas*'. When there is an imbalance in *Kapha* and *Vata*, respiratory ailments are born. *Vata* is the energy that plays a major role in inhaling and exhaling. Respiratory illness accompanied by dehydration, shortness of breath and blockage is because of more vitiated *vata*. When *Kaphadosha* (the energy responsible to bind things) goes out of balance, the mucous from the stomach goes in the respiratory tract and causes various respiratory problems. Ayurveda brings back the energies (*doshas*) to balance. The therapy includes yoga practice, proper diet regimen, and detoxification procedures. There are three unique characteristic features of Ayurvedic medicine which provide it a distinction from conventional system of medicine. These features have now emerged as most relevant today in view of the changing paradigms of health-care systems and new knowledge-base. These features are:

- 6.1 The pro nature approach,
- 6.2 The Holistic approach and
- 6.3 The personalized health-care strategy based on its fundamental *prakriti-vikriti* considerations.

Ayurveda does not see viruses and bacteria as a primary cause of disease. In this case every person would be equally susceptible to the illnesses with which they are exposed. A strong immune system is prerequisite for protection against

diseases. This is highly dependent upon a good acid-alkali balance, which can only be attained through a diet and a lifestyle tailored to suit the individual body constitution. Through strengthening the digestive system and clearing the body of toxins optimum immunity may be achieved. Ayurveda offers many remedies which may help in creating environment within the human body against corona viruses.

7. PROMOTING OJAS (VYADHIKSHAMATVA)

In present era Immunology is one of the fastest growing disciplines in Medicine and Biology. Its significance has grown more because of the growing requirement of immune strength and resistance against different diseases. *Vyadhi-kshamatva* means the factor which limits the pathogenesis and opposes the strength of disease.^[19] Ayurveda describes the bio-factor *ojas* which is the quintessence of all the seven dhatus of the body and is responsible for the immune strength of an individual classically known as *Ojabala* and *Vyadbikshamatva* which refers to natural and acquired immunity.^[20] Immunity is a biological term that describes a state of having sufficient biological defenses to avoid infection, disease or other unwanted biological invasion.

In view of the immune status of an individual being an important factor for conservation of health and prevention of disease. Ayurveda deliberates extensively on positive health measures such as life-style management, healthy dietetics and rejuvenation therapy with the help of a range of micro-medicinal nutrients called *Rasayana*. A *rasayana* remedy promotes nutritional status of an individual through qualitative changes in bodily cells and tissue leading in turn to improved bodily function, promotion of health and prevention of disease as well as longevity.^[21] These *rasayanas* are considered the therapeutic means of obtaining the best quality of *dhatus* through micro-nutrition dynamics. It is believed that a *rasayana* acts at one or all of the following levels namely.^[22]

- 7.1 At the level of *rasa* directly enriching the nutritional value of plasma. Such *rasayanas* are essentially nutrients in themselves.
- 7.2 At the level of *agni* some *rasayanas* work as digestive and metabolic boosters and lead in turn to improved nutritional status.
- 7.3 At the level of *srotas* some *rasayanas* like *guggulu* and *haritaki* promote systemic nutrition by way of *sroto-prasadana* or as promoters of micro-circulation and tissue perfusion.

All such situations promote nutritional status of an individual with improved quality of cells and tissues in the body, longevity, immunity and superior health both physical and mental. In this entire process *ojas* is the basic matrix and all *rasayanas* are supposed to be *oja-wardhaka* remedies.^[23]

Rasayana remedies of Ayurveda especially for their immunoenhancing, neuro-nutrient, anti-aging and anti-stress effect showing encouraging results now a days. Ayurvedic immunology is not merely limited to antigen antibody phenomenon in infective diseases and immune-degeneration

rather it is involved in maintenance of positive health in general including homeostasis, resistance against disease, longevity and stress tolerance with an inherent bond with the nutritional status of an individual.^[24]

8. LIFESTYLE TIPS FOR BOOSTING IMMUNITY (FOR STAGE 1, UNEXPOSED ASYMPTOMATIC GROUP)

This is a period to go within so follow the *dinacharya* (daily routine). Wake up early in the morning, brush your teeth, scrape your tongue, rinse your mouth and drink hot or warm water, then do Pranayama, it may strengthen the immune system including the *Pranavaha srotas* (respiratory system). *Rasavaha srotas* (lymphatic system) will be cleansed, and in that way it can boost the energy. This will maintain the balance of *ojas* (immunity, strength), *tejas* (digestion both subtle and gross), and *prāna* (vital life force). With pranayama we can clean *pranavaha srotas* and it will give boosting of energy so that it can keep away the virus from the human body.

Have ginger, cinnamon and cardamom tea, regular chai made with *tulsi* (holy basil, one or two leaves), or even mint, cinnamon and cardamom tea. These herbal teas boost energy. A warm bath each day is very necessary to warm the body, open the pores, and regulate your body's internal thermostat. Don't forget to do your daily ayurvedic massage (*abhyanga*) before your bath. Daily massage is very important for opening the channels, stimulating the digestion, removing toxins from the body, and pacifying the *doshas*. It is especially soothing to *Vata dosha*, which is seated in the skin. All of these factors make massage a vital therapy in strengthening immunity and preventing respiratory problems.^[25] Adequate sleep is especially important, as it counteracts the lively, moving *Vata*. It is also essential for anyone in any season who wants to enhance immunity and resist disease. Exercise is another important aspect of the ayurvedic routine, because it helps enhance *agni* and burns away toxins. It's important to choose the right exercise for your body type and for the season, though. Daily walks and yoga postures are good for balancing all the *doshas*. Exercise helps to boost *agni* and immunity when toxins are flooding in the body.

As long as we keep our Agni (digestive fire) strong, then illness will not happen. So, Ayurveda has a great way of prevention. This is how we may prevent being affected by corona virus in unexposed asymptomatic group. Keep the *agni* strong and, to do that, follow the *Dinacharya*. It is the first important thing that Ayurveda recommends.

9. DIET FOR BOOSTING NATURAL IMMUNITY (FOR STAGE 1, UNEXPOSED ASYMPTOMATIC GROUP)

The important thing is to eat light, warm foods, cooked with the immune-enhancing spices like Turmeric, Cumin, Coriander, Cardamom etc. Eat all six tastes, but prefer eating substances having balance of sweet, sour, and salty tastes, as these pacify *Vata*. *Vata*-pacifying foods include nourishing grains such as rice and couscous; sweet, juicy fruits such as cooked squashes, zucchini, and asparagus; and light, easily-digestible proteins such as *panir* (a freshly-made cheese), *lassi* (a

yogurt drink that aids digestion) and vegetable proteins such as mung dal.

10. HERBS FOR HEALTH (FOR STAGE 1 AND STAGE 2, UNEXPOSED ASYMPTOMATIC GROUP AND EXPOSED ASYMPTOMATIC QUARANTINED GROUP)

As per Ayurveda herbs which provide immunity can be taken as in daily diet *Ashwagandha*, *Mulethi*, *Amla*, *Neem*, *Tulsi*, Turmeric, Ginger, Garlic, Onion, Dryfruits, ect.^[26] There are phytochemicals in *ashwagandha*, *giloy* and *tulsi* have the potential to fight against any virus. Explore including in your diet, Ayurvedic rejuvenative herbs taken as teas or tonics such as: *ashwagandha*, turmeric, *triphala*, *amla* (Indian Gooseberry), *tulsi* (holy basil), *chyavanprash* (an Ayurvedic formulation of rejuvenating herbs plus honey and ghee).

11. GENERAL HERBAL AND NUTRIENT SUPPORT FOR INFECTIONS AND IMMUNITY ARE (FOR STAGE 1 AND STAGE 2)

11.1 Guduchi the best for immunity, fevers and infections

11.2 Chiraita boosts immunity quickly. Contains antiviral properties

11.3 Yashtimadhu possess antiviral properties and supports respiratory health

11.4 Medicinal Mushrooms possess antiviral and immune boosting properties

11.5 Ashwagandha boosts immunity, anti-stress herb, Vitamin C: strengthens immunity

11.6 Tulsi is a potent antioxidant and wonderful for respiratory health

11.7 Amla has highest natural source of Vitamin C and helps balance pitta dosha

11.8 Chyavanprash is a classic ayurvedic remedy for building immunity and *ojas*.

9. REMEDIES FOR MILD CORONA VIRUS SYMPTOMS (STAGE 3, GROUP WITH MILD SYMPTOMS)

9.1 Lemon Tea kills the sore throat removes the infection from the passageway

9.2 Ginger Tea eases your headaches caused by the respiratory infections

9.3 Lemon Honey Tea soothes your airway passage and softens your rough coughs

9.4 Mint Tea stops the runny nose and helps in easy breathing. To curb the infection of the corona virus, detoxification is important. This virus attack is contagious and if one don't want to be a victim of Wuhan pneumonia, it is best to remove toxins from your body.

10. DETOXYFY TO PREVENT INFECTIONS

Dissolve 1-2 tsf of honey in 1 cup of herbal tea (Herbs like *madhuyashti*, basil, peppermint, *vasa*), Prepare salads using detoxifying foods such as beetroot, radishes, cabbage,

and broccoli. Boil and mix them gently for cooked meal. In the Indian herbs (*Tulsi*, *Haldi*, *Giloy*, Black pepper, Ginger, Clove, Cardamom, lemon, and *Ashwagandha*) which are widely used in the preparation of Ayurvedic medicines in the form of *Kadha* to control various respiratory disorders such as cough, cold and flu. In a study, has identified an array of phytochemicals present in these herbs which have significant docking scores and potential to inhibit different stages of SARS-CoV-2 infection as well as other Corona virus target proteins. Molecular docking also indicated that, the phytochemicals present in these herbs possess significant anti-inflammatory property. The study provides scientific justification in terms of binding of active ingredients present in different plants used in *Kadha* preparation with viral proteins and target proteins for prevention and treatment of the COVID-19. This preparation can boost individual's immunity and inhibit the viral severity by interfering at different stages of virus multiplication in the infected person.

11. AYURVEDIC MANAGEMENT OF CORONAVIRUS (STAGE 3 AND STAGE 4-MILD TO MODERATE SYMPTOMS OF COVID-19)

11.1 Life starts with breath and ends with Breathlessness. Life can be maintained by proper functioning of *Pranavaha srotas* which is in connection (*moolsthana*) with *Hrudya* (Heart) and *Dashdhaminis*. This can be managed on the lines of *pratishaya*, *kasa*, *shwas* and *jwara*. If symptoms of gastrointestinal track like loss of appetite, indigestion etc is found along with it than it should also be treated along with it.

11.2 Oja (Immunity) of the patient should be increase with the help of *Rasayans*. *Rasayanas* are the drugs which help in delaying aging process, increases longevity, and Intelligence and provide disease resistant power to the individual.^[27] Best *Rasayana* to prevent corona virus can be *Giloy*, *Tulsi*, *Agastya rasayan*, *Pippali rasayana*.

11.3 Ayurveda medicines described here have safety and potential efficacy, broad-spectrum applicability, ease of availability, long-term experiential knowledge on clinical use, ease of administration, and as far as possible, and affordability.

11.4 Some common preparations available in Ayurveda may be tried which may help in prevention such as *Tribbhavankirti ras*, *Sanjeevani vati*, *Laxmi Vilas ras*, *Mahalakshmi Vilas ras*, *Chitrak Haritaki*, *Eladivati*, *Talisadi churna*, *Sitopaladi churna*, *Kantakari ghrita*, *Vasa ghrita*, *Shwaskaschintamani ras*, *hinguleshvar rasa*, *samshamani vati*, *sudarshan Ghana vati*, *shadanga paniya*, *dashmula kwatha*, *amritarishtha*, *godanti bhasma*, *tankan bhasma*, etc. which are well known and have classical references to be used in different stages of *jwara* or flu like conditions.

11.5 The key criteria for choosing *rasa anshadhi* is the urgency of initiation of therapeutic actions. *Rasaanshadhi* are shown to have better bioavailability and absorption through sublingual and oral route accounting to the nano size of their particles.^[28]

11.6 Single herbs which can be used effectively in these types of cases can be *Kantakari*, *Pushkarmool*, *Harikiti*, *Pippali*, *Tulsi*, *Sati*, *Bribati*, *Amalaki*, *Elaichi*.

11.7 *Dhoopan karma* an Ayurvedic treatment can be used to prevent the viral attack. Dhupana Karma is the use of medicated fumes (by burning of dried plant and animal parts). We can consider it as a *yagya* or *Havan* at the place where we are living. It includes fumigation for creating aseptic environment for the healthy beings so that no infectious disease can develop, especially wards fumigation and mass areas. Acharya Kashyap has explained *Arishtha dhoop* which destroys all diseases. We may use Cow dung (*Gobar*) for burning the fire and add cow ghee along with *nimbpatra*, neem fruit, neem bark, *Guggal*, *Sarso* (mustard), *Devdaru*, *Jatamansi* to make smoke. Circulate this smoke to prevent the virus entry. This may be done for stage 2 and 3 groups.

12. CONCLUSION

Today it is Corona virus, tomorrow another one. It is not possible to stop the outbreaks of any undetermined viral attacks. It is best to build the firewall, strengthen the system and crush all the malicious viruses. Ayurveda may have enough potential and possibilities to be employed both for prevention and treatment of COVID-19. This will provide an important opportunity for learning and generating credible evidence. Implementation of proposed action is likely to provide evidence-based insights strengthening the scope of Ayurveda beyond preventive health care and care for non-communicable diseases. Prevention is better than cure. So boost the immunity to prevent the virus entry inside the body and win the fight against them.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

CONTRIBUTORS

Dr. Bhavana Mawar designed the manuscript, did literature survey to collect valuable information with references. Dr Ramakant Yadava and Dr. Raja Ram Mahto contributed to conceptualization of the topic and proof reading.

SUMMARY

The COVID-19 pandemic is a world challenge as the cases are increasing everyday. Traditional Indian Medicine (Ayurveda) has a lot to offer in the management of Covid-19. The approach of Ayurveda on strengthening host defense through boosting

the immunity may be useful as effective, safer, accessible and affordable prophylaxis of Covid-19. Corona virus encroaches the immune system. Boosting the immune system will cause repulsion of virus. Ayurveda offers many remedies and medicines which may help in creating environment within the human body against corona viruses. In the current Article clinical presentation, Pathophysiology, Risk Factors of Covid-19 is mentioned and A systematic Ayurveda approach against Covid-19 is mentioned through promoting Ojas, Lifestyle tips for boosting immunity, Herbs for health, General Herbal and Nutrient support for infections and immunity, Remedies for mild Corona virus symptoms, Ayurvedic management of corona virus and stage wise management. So, Ayurveda may have enough potential and possibilities to be employed both for Prevention and Treatment of Covid-19.

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