

# **Yarsa-Gunbu (Cordyceps sp.) an Important Medicinal Ingredient of Sowa-Rigpa and its Potentials for Management of COVID-19**

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## INTRODUCTION TO YARSA-GUNBU (CORDYCEPS)

Cordyceps is a genus of ascomycete fungi that includes about 600 species. Most Cordyceps species are endoparasitoids, parasitic mainly on insects and other arthropods; a few are parasitic on other fungi. The generic name Cordyceps is derived from the Greek word κορδύλη *kordýlē*, meaning "club", and the Greek word κεφαλή *cephali*, meaning "head". Yarsa-gunbu is a Tibetan term for Cordyceps and it means summer grass and winter worm. Yarsa-Gunbu is actually referred to *Cordyceps Sinensis* but due to scarcity of naturally grown *Cordyceps Sinensis*, *Cordyceps Militaris* is also used for medicine considering the similar properties of both the species.



**C. Militaris**



**C. Sinensis**





-cultivated in  
laboratory  
conditions on rice



-grows naturally  
on caterpillars at  
high altitudes

## Comparison the between *Cordyceps sinensis* and *Cordyceps Militaris*

<u><i>Cordyceps sinensis</i></u>	<u><i>Cordyceps Militaris</i></u>
	
<ul style="list-style-type: none"> <li>➤ Parasitic complex of a fungus</li> <li>➤ Contains insect compounds (useful as well as toxic)</li> <li>➤ Cultivated at high altitude 3500 -5000 meters above</li> <li>➤ Very costly</li> </ul>	<ul style="list-style-type: none"> <li>➤ Pure fungus</li> <li>➤ Pure cordyceps compound</li> <li>➤ Domesticate anywhere with controlled environment condition</li> <li>➤ Alternative with similar potency</li> </ul>
<b>MORPHOLOGY</b>	
<ul style="list-style-type: none"> <li>➤ Single stromata</li> <li>➤ Yellow-brown, light yellow</li> <li>➤ Composite consisting of the stroma parasitizing the larva of insects, cylindrical, 4–7 cm in length</li> </ul>	<ul style="list-style-type: none"> <li>➤ Bunch stromata</li> <li>➤ Orange-yellow to orange-red</li> <li>➤ Stroma flattened, slightly curved, about 5 cm in length</li> </ul>
<b>METABOLIC DIFFERENCE</b>	
<ul style="list-style-type: none"> <li>➤ Cordycepin present</li> <li>➤ Antioxidant efficiency is lesser</li> <li>➤ Adenosine Is high</li> <li>➤ Lesser metabolite expressed</li> <li>➤ Higher content of sphingosine</li> <li>➤ Less metabolites available in <i>C. Sinensis</i></li> <li>➤ Polysaccharides (~6%)</li> <li>➤ High oxylipins</li> <li>➤ Beauverolides absent</li> </ul>	<ul style="list-style-type: none"> <li>➤ The content of Cordycepin is ~100 times higher</li> <li>➤ antioxidant efficiency is high</li> <li>➤ Adenosine present but lesser to <i>C. Sinensis</i></li> <li>➤ Higher than <i>C. Sinensis</i> (among 69 metabolites, 25 different metabolite were found more expressed)</li> <li>➤ Less sphingosine</li> <li>➤ 10-membered macrolides only available in artificial cultivated <i>C. Militaris</i></li> <li>➤ High Polysaccharides (~30%)</li> <li>➤ Less oxylipins</li> <li>➤ Beauverolides present</li> </ul>

## HISTORY OF YARSA-GUNBU (CORDYCEPS)

Yarsa-gunbu or Cordyceps are well known in Sowa-Rigpa system of Medicine, it has been used for centuries. Being a very rare mushroom, Yarsa-gunbu has a long medicinal history with diverse therapeutic applications in many countries, but the earliest reference of medicinal use is documented in Sowa-Rigpa. It is said to be the most expensive herb in the world today.

Cordyceps was found around 1500 years prior in Tibet. The Nepalese and Tibetan herders, who in springtime observed yaks and goats consuming Cordyceps acting abnormally in the high mountain fields, the animals would get energetic and playful and begin pursuing each other around with the desire. The earliest known documentation of Yarsagumba is by Nyamnyi Dorje, a Tibet doctor and lama who lived from 1439-1475. His content named "An Ocean of Aphrodisiacal Qualities", depicts the estimation of the mushroom as a sexual tonic (Sources: Journal of the International Association of Tibetan Studies and National Institute of Sowa Rigpa NISR, Leh Ladakh, India).

Around 200 years after the fact, the Emperor's doctors in the Ming Dynasty found out about this Tibetan marvel and utilized this information with their own intelligence to grow ground-breaking and intense medication. Introductory records of Cordyceps as medication date from the Qing Dynasty in China in 1757. Its present high worldwide profile and request grew just at some point in 1993 when many Chinese long-distance runners broke world records. In 1843 it was first described by The British mycologist Berkely as *Sphaeria Sinensis* Berk. Later, Saccardo renamed it *Cordyceps Sinensis* in 1878. The scientific name *Cordyceps Sinensis* (Berk) Sacc. is stated to be the final form, which is the fruiting body of the fungus arising out of the dead body of a caterpillar. The parasite was known as *Cordyceps Sinensis* until 2007, when the subatomic investigation was utilized to improve the characterization of the Cordycipitaceae and the Clavicipitaceae, bringing about the naming of another family Ohio Cordycipitaceae and the exchange of a few Cordyceps animal categories to Ophiocordyceps. Hence *Cordyceps Sinensis* is also known as *Ophiocordyceps Sinensis*. More than 350 types of Cordyceps or its substitutes in terms of their medicinal values have been found worldwide today, such as *Cordyceps Militaris*. Among them, only *Cordyceps Sinensis* and *Cordyceps Militaris* are used for medicinal values.

## YARSA-GUNBU: CURRENT RESEARCH BASED APPLICATION AGAINST COVID-19

On the recommendation of National Institution of SOWA-RIGPA, Ministry of AYUSH, Govt. of India, Leh-Ladakh and with advice of the Indian Council of Medical Research (ICMR), the thorough Research, development and clinical trials have been conducted successfully at the leading institutions like AIIMS Bhopal, AIIMS Nagpur, Punjab University, Patiala, MGMH Navi Mumbai and CCMB, Hyderabad by Ambrosia Food Farm Company, Bhowali, Uttarakhand, India.

### Research Title

**A Randomized, Double Blind, Placebo Controlled Study to Evaluate the Efficacy and Safety of Cordyceps Capsules (Food Supplement) as an Add-On Therapy in Patients with Mild to Moderate COVID-19 Infection**

### Background

COVID-19 infection became a global public health concern with limited therapeutic options to treat this condition. Treatment interventions which are effective, safe and tolerable are urgently needed for COVID-19 infection. Due to potential anti-inflammatory, antiviral and lung effects and well characterized safety profile, Cordyceps as was hypothesized to show effectiveness in COVID-19 infection as an add on therapy and therefore this double-blind, randomized, placebo-controlled, proof of concept study was planned to evaluate efficacy and safety effect of Cordyceps as an add on therapy in treatment of mild (symptomatic) to moderate SARS-CoV-2 infection. Numerous repurposed and investigational drugs such as remdesivir, chloroquine, hydroxychloroquine, ritonavir, lopinavir and interferon-beta are currently being studied for COVID-19 treatment but their side effects limit their usage among the infected patients.

Moreover, COVID-19 vaccine hesitancy is increasing worldwide owing to the fear of side effects. Under such condition, a natural product 'Cordyceps immune booster' with minimal side effects can be a useful. Cordycepin, a pure compound and Cordycepin powder derived from ***Cordyceps Militaris*** was tested for their anti-viral properties in ***In Vitro*** assay to detect inhibition of SARS-CoV-19 virus in vero cells. Based on our results, it was observed that Cordycepin at 6  $\mu$ M concentration inhibits 70% of the virus in the assay procedure. The primary objective of the study was to evaluate the efficacy of Cordyceps capsules as an add-on therapy to standard treatment for the treatment of SARS-CoV-2 infection. The **secondary objectives were** to evaluate the safety of Cordyceps capsules as an add-on therapy to standard treatment in patients with mild (symptomatic) to moderate SARS-CoV-2 infection and to evaluate the immune modulatory effect of Cordyceps capsules as an add-on therapy to standard treatment in patient with mild (symptomatic) to moderate SARS-CoV-2 infection.

### Methods:

This was a randomized, double blind, placebo-controlled study of Cordyceps capsules (food supplement) as an add-on therapy in patients with COVID-19 infection. After obtaining informed consent, patients who met all of the inclusion criteria and none of the exclusion criteria were randomized to one of the two groups and received either Cordyceps capsules as an add on

therapy to standard treatment protocol or placebo plus standard treatment protocol for the treatment of patients with mild (symptomatic) or moderate SARS-CoV-2 infection. Individual patients' participation was for 30 days.

- **Arm 1 (n=40):** Cordyceps capsules plus standard treatment.
- **Arm 2 (n=40):** Placebo plus standard treatment.

*All visits were done in ambulatory setting for both mild and moderate category patients unless the patients with moderate infection was required to hospitalized as per the PI discretion.* For hospitalized patients, if the patient was discharged before Day 15 then the patient had to come for Day 16 visit. Day 30 visit was mostly done telephonically. During hospitalization period (at all the other days than that mentioned for trial related investigations), vitals and physical examination, compliance, disease evaluation was done as per the hospital policy. After taking informed consent, eligible patients were randomized to one of the two groups to receive either Cordyceps capsules as an add-on to the standard treatment protocol or placebo plus standard treatment protocol on Day 1.

Demographics and medical history were taken as a part of screening. Vitals were recorded on all days for hospitalized patients and on Day 1, Day 5, Day 10 and Day 16 for ambulatory visit patients. Complete physical examination was done at screening. At subsequent days, abbreviated examination was done. Height was measured at screening only and weight was measured at all visit days. X-ray chest and ECG was done on screening visit and on Day 16.

RT-PCR test was done on screening if required and on Day 10. Haematology, biochemistry and urinalysis testing were performed on screening, Day 5, and Day 16. Biomarker analysis was performed at screening, Day 5 and Day 10 and includes IL-1, IL-6, MCP-1, IP-10, Ferritin, D-dimer, CRP and induced nitric oxide synthase (iNOS). COVID IgG antibodies testing were done on Day 16. Arterial blood gas analysis (pH, PaO<sub>2</sub>, PaCO<sub>2</sub>, HCO<sub>3</sub> and SaO<sub>2</sub>) were performed at screening, Day 5 and Day 10 for moderate category patients. Standard treatment protocol as per recent Clinical Management Protocol for Covid-19, given by Government of India was implemented. Patients received treatment depending on the clinical condition of the patient. Cordyceps 500 mg capsule or matching placebo was administered three times a day after food (e.g., breakfast, lunch and dinner). Cordyceps capsules or placebo were administered at approximately the same time each day as an add-on to the standard therapy. If patient get discharged earlier, he/she was to be taken Cordyceps/placebo capsules at home. The total dose of Cordyceps was 1.5 gm. per day for 15 days. Cordyceps 500 mg capsule or matching placebo was administered three times a day after food (e.g. breakfast, lunch and dinner). Cordyceps capsules or placebo was administered at approximately the same time each day as an add-on to the standard therapy. If patient get discharged earlier, he/she was to be taken Cordyceps/placebo capsules at home.

## Results

A total 65 patients were enrolled in the study on Day 1 after confirming eligibility; 33 patients were enrolled in Cordyceps group, and 32 in the placebo group. Out of these, 07 patients (3 in Cordyceps group and 4 in placebo group) did not take any medication and deemed discontinued from the study. Total 58 patients were considered evaluable for the analysis; 30 patients in

Cordyceps group and 28 in Placebo group. Out of 30 patients in the Cordyceps group; 27 (90.0%) were of mild category and 3 (10.0%) were of moderate category. Out of 28 patients in the Placebo group; 23 (82.1%) were of mild category and 5 (17.9%) were of moderate category.

### Demographics:

Mean age of all the patients enrolled in the study was  $42.34 \pm 13.61$  years. Mean age of patients receiving Cordyceps capsules was  $42.55 \pm 14.71$  years and that of patients receiving Placebo was  $42.12 \pm 12.59$  years. There was male preponderance; 42 (64.61%) were male and 23 (35.38%) were female.

### Vitals and physical examination:

Physical examination of patients was normal at all visits. There was no significant change in vital parameters at Day 5, Day 10, and Day 16 as compared to Day 1 visit in patients receiving Cordyceps capsules except in systolic BP and Pulse rate. However, the changes in systolic BP and Pulse rate are not clinically significant.

### Chest X-ray:

On Day 1, majority of the patients had normal chest X-ray; 53.3% in Cordyceps group and 64.3% in placebo group. Other important findings were bilateral lower zone infiltrates and ground glass opacities in bilateral lower zones. On Day 16, all patients had normal chest X-ray.

### Recovery of patients

Proportionately higher number of patients recovered in Cordyceps group 18 (60%) as compared to Placebo group 15 (53.6%) on Day 5. Improvement was mainly seen in mild patients.

On Day 10, similar proportion of patients recovered in Cordyceps group 25 (83.3%) and Placebo group 24 (85.7%).

On Day 16 and Day 30, all patients with mild and moderate category recovered in both groups.

### Time to Improvement of Clinical Symptoms

Overall, patients receiving Cordyceps had mean improvement of clinical symptoms earlier than the patients receiving Placebo ( $6.6 \pm 2.8$  days Vs  $7.0 \pm 3.3$  days). In mild category, patients receiving cordyceps had symptoms improved a day earlier as compared to patients receiving placebo ( $6.6 \pm 2.9$  days Vs  $7.8 \pm 3.8$  days). In moderate category, the mean time to improvement of symptoms was  $6.0 \pm 2.6$  days in Cordyceps group and  $6.0 \pm 2.1$  days in Placebo group.

### Time to Recovery of Clinical Symptoms

The mean time to recovery of symptoms were comparable between Cordyceps and Placebo groups. Similarly, mean time to recovery of symptoms were comparable between Cordyceps and Placebo groups for mild and moderate category patients.

### Status of RT-PCR at Day 10

Proportionately higher number of patients showed RT-PCR negative result in Cordyceps group 17 (56.7%) as compared to Placebo group 13 (46.4%) on Day 10.

### Serum biomarkers

There was no significant change in the mean values of IL-6, ferritin, LDH, CRP and D-dimer levels at Day 5 and Day 10 as compared to Day 1 values in patients receiving Cordyceps capsules. Also, the comparison in between the patients receiving Cordyceps capsules and Placebo capsule was not significant statistically. There was significant change in the mean values of MCP-1, CXCL10 and IL-1 $\beta$  levels at Day 5 and Day 10 as compared to Day 1 values in patients receiving Cordyceps capsules. However, this change was seen in Placebo group also. The comparison in between the patients receiving Cordyceps capsules and Placebo capsule was not significant statistically except for CXCL10 where the comparison was significant at Day 10. Significant changes were seen in biomarkers CRP and CxCL10 in moderate category patients at Day 5 and Day 10 respectively. The mean IgG levels at Day 16 was  $26.86 \pm 27.45$  in Cordyceps group and  $16.52 \pm 22.86$  in Placebo group.

### TEAEs

Overall, 10 (17.2%) patients developed 16 treatment emergent adverse events (TEAEs). Out of these, 12 TEAEs were reported in 6 (20.0%) patients receiving Cordyceps capsules and 4 TEAEs were reported in 4 (14.3%) patients receiving placebo capsules. Nine TEAEs were treatment related. Of these, 5 TEAEs were related to Cordyceps capsules and 4 TEAEs were related to Placebo capsules. 3 (10.0%) patients in Cordyceps group and 4 (14.3%) patients in Placebo group reported the related TEAEs. None of the patients in the study developed severe and serious TEAEs. Two patients had drug interruption due to progression of disease to moderate category. Overall, incidence of TEAEs were minimal. The reported TEAEs belong to the gastrointestinal system followed by General disorders and administration site conditions and Nervous system disorders. Gastrointestinal TEAEs were common in patients who received Cordyceps capsule as well as the Placebo capsules.

### Laboratory assessment:

The haematology parameters in Cordyceps group did not change significantly at Day 5 and Day 16 from the Day 1 visit except WBC count, platelet count and eosinophil count. These counts changes significantly at Day 16 as compared to Day 1 values but does not have any clinical significance. The biochemistry parameters in Cordyceps group did not change significantly at Day 5 and Day 16 from the Day 1 visit except ALP, ALB and BUN. Though these values changed significantly at Day 5 and Day 16 as compared to Day 1 values, but it does not have any clinical significance.

### Summary

On the basis of the *in-silico* study of the nucleosides present in *C. Militaris*, it can be concluded that they may be effective in the treatment of SARS-CoV2 by following mechanism similar to



that of the tested drug remdesivir i.e. RdRp inhibition. Overall theoretical and literature analysis of the key phytoconstituents of this marketed fungal formulation suggest that it may be imperative to explore it for the extended therapy in COVID-19. Since this product is already in market with no significant toxicity (as reported in the literature), investigator suggests Ambrosia food farm.co for its preclinical and subsequent clinical evaluation as an 'add on therapy' in COVID patients owing to immense urgency to manage this global pandemic situation. Cordyceps capsules given at a dose of 500mg three times a day along with supportive treatments showed effectiveness in patients with mild to moderate Covid-19 infection as evident by proportionately higher number of recoveries at Day 5, relatively shorter time for improvement of clinical symptoms, proportionately higher number of patients showing negative RT-PCR test on Day 10 and significant change in biomarkers such as CRP, CxCL10 and IL-1 $\beta$  on day 5 and 10 as compared to baseline. Cordyceps capsules given at a dose of 500mg three times a day along with supportive treatment showed effectiveness in patients with mild to moderate Covid-19 infection as evident by proportionately higher number of recoveries at Day 5, relatively shorter time for improvement of clinical symptoms, proportionately higher number of patients showing negative RT-PCR test on Day 10. Significant changes were seen in biomarkers MCP, CxCL10 and IL-1 $\beta$  for overall (both mild and moderate patients) on Days 5 and 10 as compared to baseline; and in biomarkers CRP and CxCL10 in moderate category patients at Day 5 and Day 10 respectively. Recovery of symptoms was mainly seen in mild patients, where in patients receiving Cordyceps had symptoms improved a day earlier as compared to patients receiving placebo (6.6 days Vs 7.3 days). The statistical significances could not be reached between group comparisons with Placebo for various parameters, due to limited sample size in this signal seeking study. No significant worsening of the disease related markers such as CRP, IL-6, ferritin, and D-dimers signifying that the disease was not worsened in patients who received Cordyceps, further confirming that the disease severity remained stable and did not worsen over a period. Thus, this proof of concept, signal seeking study showed the role of Cordyceps as an add on therapy in the treatment of patients with mild to moderate Covid-19 infection. Cordyceps at a dose of 500 mg three times a day for 15 days were safe and well tolerated in patients with mild to moderate Covid-19 infection. The reported TEAEs were mild to moderate in severity and were managed with/without medications. No meaningful drug related changes were observed in vitals, haematology, biochemistry, urinalysis, and ECGs in patients receiving Cordyceps capsules and changes were similar to Placebo. None of the patients in the study had severe or serious TEAEs. There was no drug interruption and dose reduction due to adverse events any of the patient. This is to be expected, based on the known safety profile of the active ingredients and their long history of use of Cordyceps in humans.

## Conclusion

Cordyceps at a dose of 500 mg three times a day for 15 days were safe and well tolerated in patients with mild to moderate Covid-19 infection. The reported TEAEs were mild to moderate in severity and were managed with/without medications. No meaningful drug related changes were observed in vitals, haematology, biochemistry, urinalysis, and ECGs in patients receiving Cordyceps capsules. None of the patients in the study had severe or serious TEAEs. There was no drug interruption and dose reduction due to adverse events in any of the patient. Overall, the results from present study are encouraging and offers Cordyceps as a safer and effective add on therapy to standard of care treatment in patients with mild to moderate Covid-19 infection.

## WHY YARSA-GUNBU (CORDYCEPS) IS IMPORTANT IN COVID-19 TREATMENT?

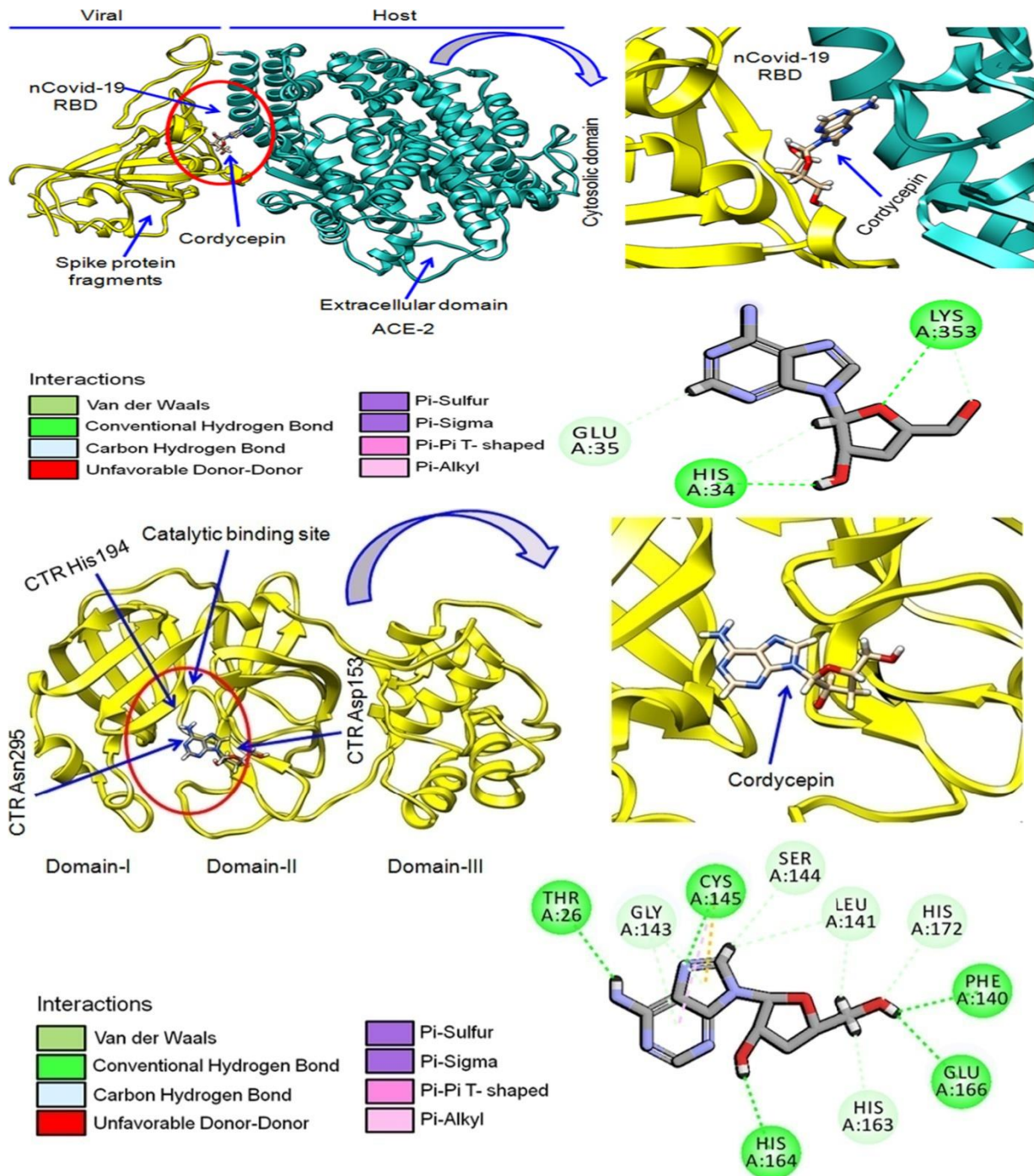
Cordyceps capsule is prepared from the medicinal mushroom *Cordyceps Militaris*, which contains several bioactive molecules and nucleotide analogue. It helps covid patients in both curative and preventive method. The major working of Cordyceps/Yarsa-Gunbu (active ingredient cordycepin) is:

1. **Binding Spike Protein of Covid-19 virus** (this process helps covid patients to prevent covid-19 virus entry into human cells)
2. **RdRp Inhibitor** (prevent multiplication of RNA of Covid-19 virus, hence no increase in viral load and no viral protein formation and no further spread of virus. It is effective on all kind of Covid-19 variants including omicron)
3. **Higher level of Anti-body (IgG) generation** (anti-body generation prevent further infection of Covid-19, if Cordyceps capsules consumed during covid-19 treatment it helps in generation of higher level of Antibodies against covid-19)

## 1. Binding Spike Protein of COVID-19 virus

(This process helps COVID infected patients to prevent COVID-19 virus entry into human cells)

Fig: Functioning of Corycepin targeting SARS-CoV-2 spike and main protease

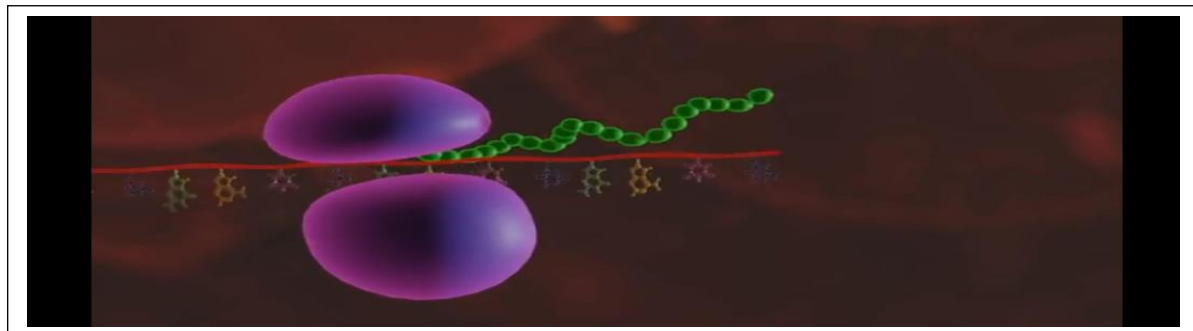
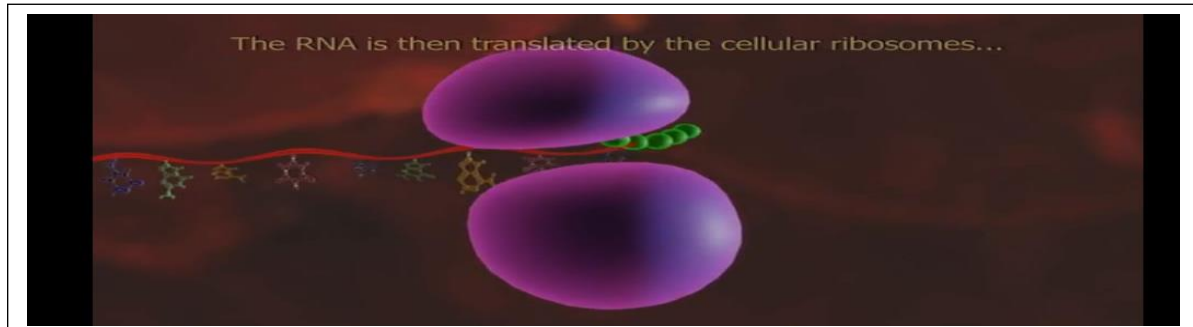
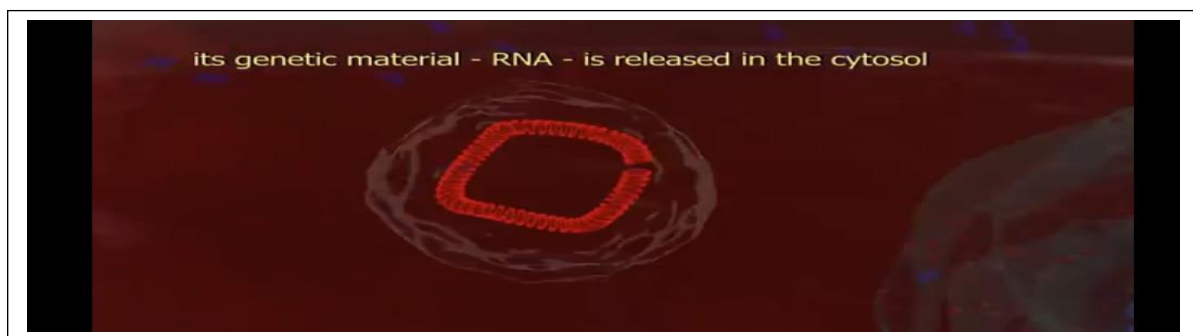
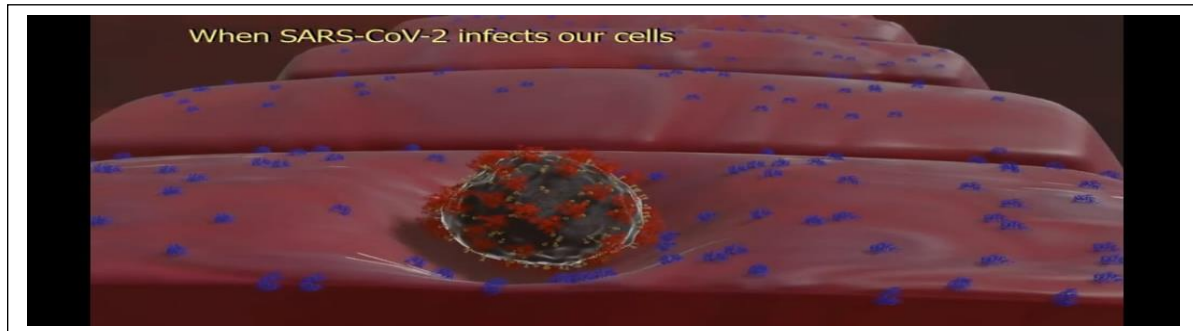


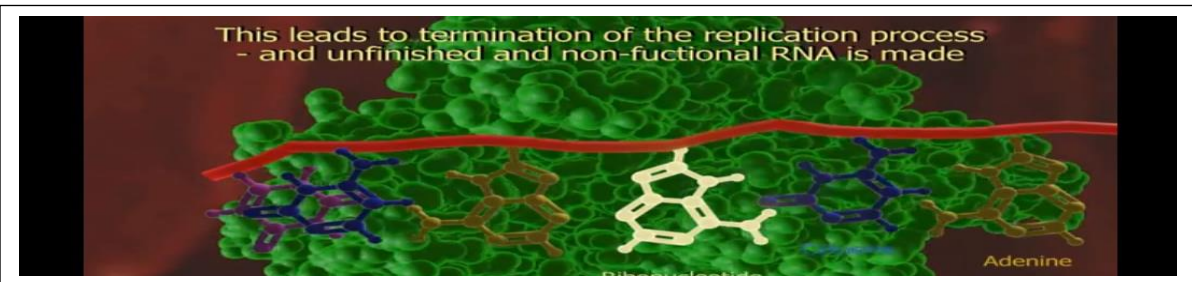
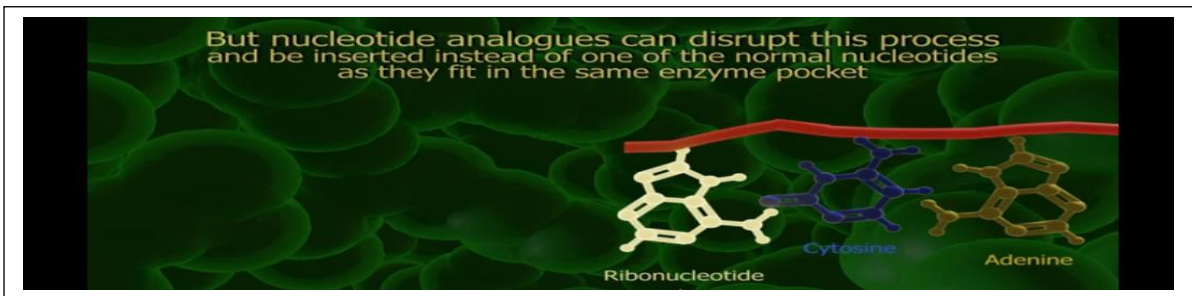
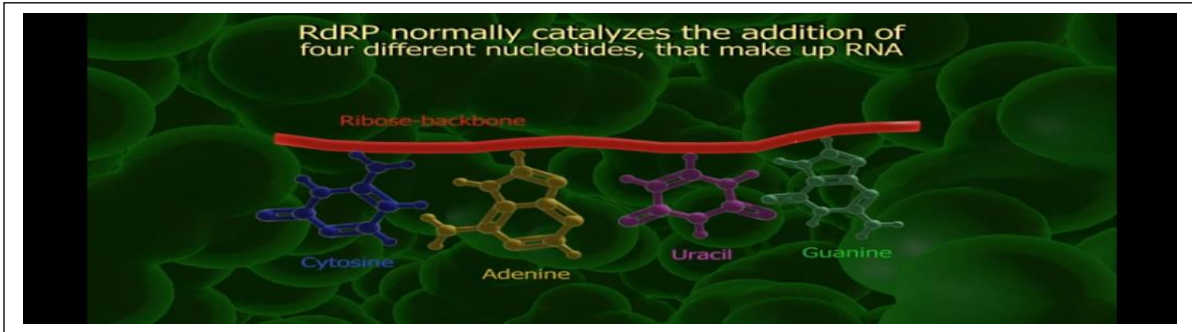
## 2. RNA Dependent RNA Polymerase (RDRP) inhibitor

It prevent multiplication of RNA of Covid-19 virus, hence no increase in viral load and no viral protein formation and no further spread of virus and no further mutation. It is effective on all

kind of Covid-19 variants including omicron)

( Here Cordyceps Bioactive molecule Cordycepin is working as Ribonucleotide Analogue, which inhibits RDRP)





### 3. Higher level of Anti-body (IgG) generation

Anti-body generation prevent further infection of Covid-19, if Cordyceps consumed during covid-19 treatment it helps in generation of higher level of Antibodies against covid-19

**Table 11.1- 19: Comparison of Immune Marker IgG between Two Groups at Day16**

Parameter	Group		P-value*
	Cordyceps	Placebo	
	Mean $\pm$ SD	Mean $\pm$ SD	
IgG	26.86 $\pm$ 27.45	16.52 $\pm$ 22.86	0.141

\*Obtained using t-test for independent samples

## YARSA-GUNBU: RECOMMENDED BY OTHER LEADING RESEARCH INSTITUTES

### 1) Centre for Cellular & Molecular Biology (CSIR-CCMB), Hyderabad: Antiviral Activity of Cordyceps against Covid-19

सीसीएमबी  
CCMB

सीएसआईआर-कोशिकीय एवं आणविक जीवविज्ञान केन्द्र  
CSIR-CENTRE FOR CELLULAR AND MOLECULAR BIOLOGY

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)  
(Council of Scientific & Industrial Research)

(विज्ञान एवं प्रौद्योगिकी मंत्रालय, भारत सरकार / Ministry of Science & Technology, Govt. of India)

उप्पल रोड, हब्सीगुडा, हैदराबाद - 500 007, तेलंगाना, भारत

Uppal Road, Habsiguda, Hyderabad - 500 007, Telangana, India



26<sup>th</sup> August, 2020

#### Report on the Anti-Viral Effect of Cordycepin in *In-Vitro* Assay

Cordycepin, a pure compound and Cordycepin powder derived from *Cordyceps militaris* was supplied by the company Clone Deals Pvt. Ltd., Hyderabad. The compounds were tested for their anti-viral properties in *In Vitro* assay to detect inhibition of SARS-Cov-19 virus in vero cells. Based on our results, it is observed that **Cordycepin at 6 $\mu$ M Concentration inhibits 70% of the virus in the assay procedure** (Annexure attached).

Signature of Coordinator at Validation Centre  
(Dr. N. Madhusudhana Rao)

फिक्स	अंतर्राष्ट्रीय भारत	+91-40-27160591, 27160311 040-27160591, 27160311	दूरभाष Telephone	+91-40-27160222-41
Fax	International India	+91-40-27160591, 27160311 040-27160591, 27160311	वेब साइट Website	<a href="http://www.ccmb.res.in">http://www.ccmb.res.in</a>

## 2) Defence Institute of Bio-Energy Research (DIBER) - DRDO: Cordyceps (Yarsa-gunbu) as an Immunomodulating Agent



**DEFENCE RESEARCH &  
DEVELOPMENT ORGANISATION**



**Ministry of Defence  
Govt of India**

K. P. Singh, Principal Scientist  
Defence Institute of Bio-Energy Research (DIBER), DRDO, Field Station  
Pithoragarh-262 501, India  
E-mail: kpvte@rediffmail.com

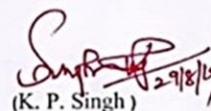
*Cordyceps militaris* has been known to have so many medicinal properties preventing or curing a number of diseases in the local regions. Local people have been found to use the fungus for enhancing stamina, respiratory efficiency, immunomodulation, and treatment of liver, renal, respiratory and cerebrovascular diseases for a very long time. The fungus has also been used for increasing athletic power. Because of the high medicinal properties.

Another reason for antidepressant like effect of *C. militaris* may also be elicited due to inhibition of monoamine oxidase (MAO), which is involved in catabolism of excitatory neurotransmitters. However, a further investigation is still required to find out the mechanism involved for antidepressant like activity of *C. militaris*

In the view, it can be concluded that natural as well as LCM of *C. militaris* have capacity to increase the motor coordination in form of increased muscle endurance or antifatigue like activity and mood elevator or antidepressant like activity as a result of decreased endogenous depression. The neuromuscular effect of LCM of *C. militaris* was almost similar to that of natural samples. Hence, in vitro propagated *C. militaris* can be used in development of product formulation for improving human neuromuscular activity and quality of life..

The experimental protocol was approved by the Institutional Human Ethics Committee and Human care was taken as per the guidelines of CPCSEH (Registration No. 306/a/09/ CPCSEH, Dated 3rd Apr 2014), Government of India.

Thank You

  
(K. P. Singh)



## OTHER INTERNATIONAL RESEARCH ON CORDYCEPS AGAINST COVID-19

- 1) **The Indonesian Institute of Sciences (LIPI):** has been conducting clinical trials of herbal medicines to cure COVID-19 patients. The clinical trials took place at the Wisma Athletes Emergency Hospital for COVID-19 Patients in Kemayoran on June 8.

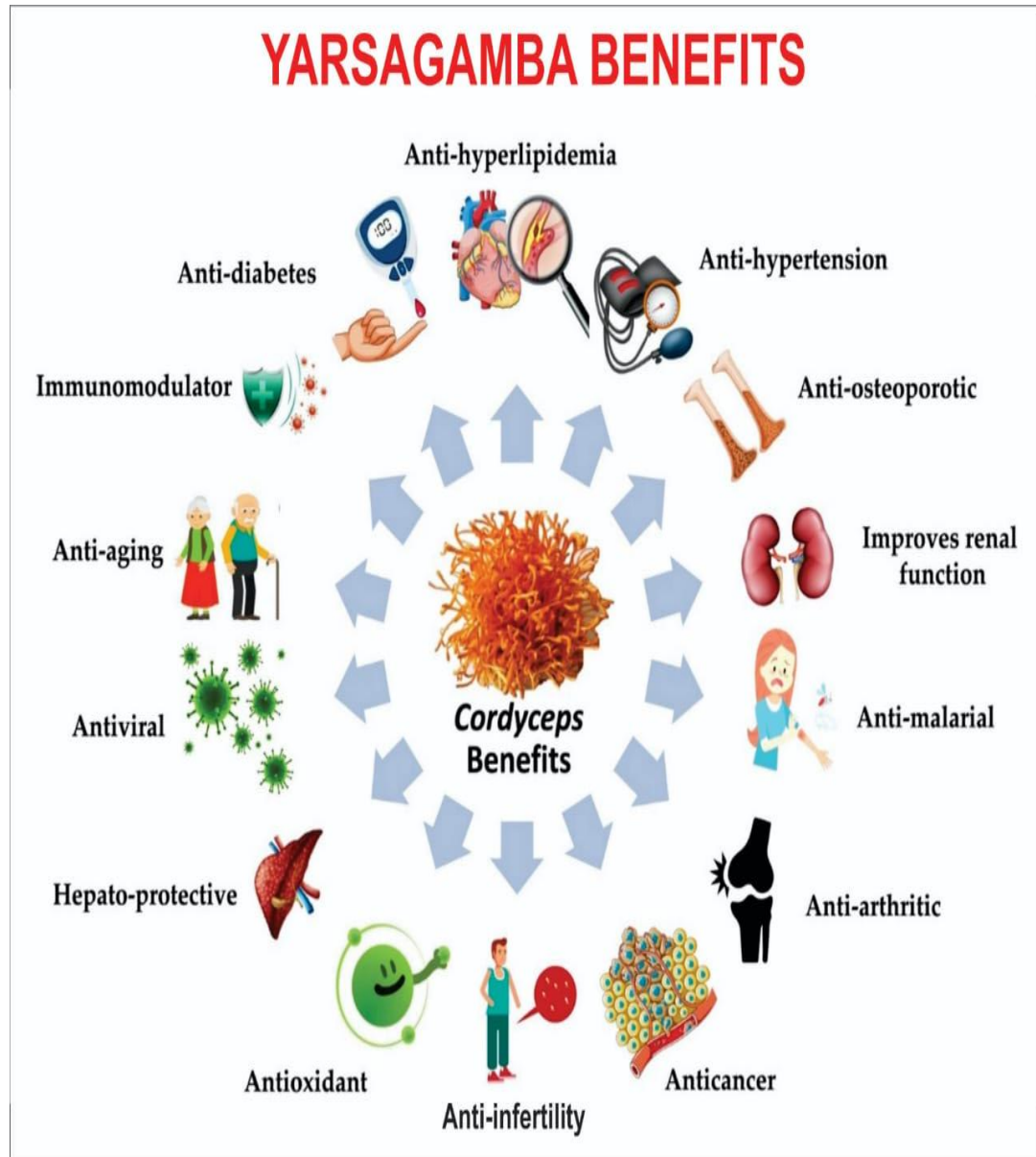
Two herbal medicines are used: Cordyceps Militaris and a combination of herbs. The LIPI research team have done the clinical trials on 90 COVID-19 patients in three groups.

<https://go.kompas.com/read/2020/06/13/133853974/get-to-know-more-about-cordyceps-Militaris-for-covid-19-treatment?page=all>

- 2) **Monash University, Australia:** A rare Tibetan worm may hold key to long-acting COVID vaccines. The best types of mRNA vaccines are those that only encode the target antigen (in the case of COVID vaccines, the spike protein) and contain 5' and 3' untranslated regions (UTRs), which provide comprehensive stimulation of the adaptive and innate immunity. "Studying the Cordyceps fungi molecule and how it can be used to understand the function of 3'UTRs is a key step in making better vaccines against infectious diseases like COVID-19 and also cancers," Associate Professor Beilharz said.

<https://www.monash.edu/discovery-institute/news-and-events/news/2021-articles/a-rare-tibetan-worm-may-hold-key-to-long-acting-covid-vaccines>

## OTHER YARSAGUNBU (CORDYCEPS) RESEARCH BASED APPLICATIONS IN VARIOUS DISEASES & DISFUNCTION



## AVAILABILITY OF CORDYCEPS & CORDYCEPS PRODUCTS

Cordyceps and Cordyceps product are available in India and there are many companies and groups that are growing Cordyceps Militaris for commercial sale, but consumers have to be careful about the genuineness and quality of the product. Natural Cordyceps Sinensis is very hard to find and expensive, it costs around USD 32,000 per kg whereas, Cordyceps Militaris is grown in India also and the production can be scaled up. The following is a basic firsthand information

### DRY AND RAW YARSAGUNBU (CORDYCEPS)



Info.	Description
<b>Name</b>	Pure dry, and raw cordyceps
<b>Certification</b>	ISO 9000, ISO 22000, GMP
<b>Category</b>	Dry Cordyceps fruiting bodies
<b>Status</b>	Actively available in Indian Market
<b>Content</b>	Cordycepin and adenosine along with all other biomolecules
<b>Form</b>	Dry Form, whole fruiting bodies
<b>Research Based Product</b>	Yes
<b>Export</b>	Open for Export
<b>Ex-Factory Price</b>	50,000 INR per kg or 656 USD
<b>Packaging</b>	1-5 kg per pack, Food Grade
<b>MoQ</b>	100 KG
<b>Purchase Order</b>	20 days before the supply
<b>Payment</b>	100% advance through NISR

## YARSAGUNBU (CORDYCEP) CAPSULES



<b>Info.</b>	<b>Description</b>
<b>Name</b>	Pure YARSAGUNBU (Cordyceps) Capsules
<b>Certification</b>	SOWA-RIGPA validation and FASSAI license for specific food supplement for specific disease management
<b>Category</b>	Add on drug and food supplement for Covid-19 patients (mild and Moderate)
<b>Status</b>	Available through NISR, Leh, Laddakh
<b>Content</b>	Cordycepin & other various biomolecules (synergistically)
<b>Form</b>	Oral Capsules (500 mg each)
<b>Research Based Product</b>	Yes, through AIIMS, CCMB, PUNJAB UNIVERSITY
<b>Export</b>	Open to advance booking for Export
<b>Packaging</b>	9 capsules per strip ( 3 capsules for each day), 5 strips in one pack ( 15 days complete course), 30 capsules per bottle
<b>Price</b>	50 INR/0.65USD per capsule (ex factory price)+ Tax
<b>MoQ</b>	1000 pack of 30 capsules
<b>Purchase Order</b>	20 days before the supply
<b>Payment</b>	100% advance

## YARSAGUNBU (CORDYCEP) LIQUID EXTRACT (MINI-BOTTLES)



Info.	Description
<b>Name</b>	Pure YARSAGUNBU (Cordyceps) Extract Mini-Bottles
<b>Certification</b>	SOWA-RIGPA validation and FASSAI license for specific food supplement
<b>Category</b>	Immunity Booster & Immunomodulator
<b>Status</b>	Available through NISR, Leh, Laddakh
<b>Content</b>	Cordycepin & other various biomolecules (synergistically)
<b>Form</b>	Oral Suspension Homogeneous Extract (5ml each)
<b>Research Based Product</b>	Yes, CCMB Hyderabad
<b>Export</b>	Open to advance booking for Export
<b>Packaging</b>	Pack of 6 Mini-Bottles (5ml Each)
<b>Price</b>	75 INR/ 1USD per mini-bottle(ex factory price)+ Tax
<b>MoQ</b>	1000 pack (each 6 mini-bottles pack capsules )
<b>Purchase Order</b>	20 days before the supply
<b>Payment</b>	100% advance

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Home > Covid-19 > Trial underway for using Cordyceps capsules in Covid-19 treatment

COVID-19 HEALTH TOP NEWS TRENDING

### Trial underway for using Cordyceps capsules in Covid-19 treatment

October 19, 2020

New Delhi (NVI): A translational trial is underway for using Cordyceps Capsules- prepared with Cordyceps herb having immunological and anti-viral properties — for potential treatment in COVID-19.

Friday, 19 October 2020

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### Trial underway for use of Cordyceps Capsules in Covid treatment

Tuesday, 27 October 2020 | PMS | New Delhi

SHARE

Three regional AIIMS have taken up the translational trial for using Cordyceps Capsules for treatment in COVID-19 and the efforts and trials are going on for preparing it as a preventive and curative medicine for Corona.

The first trial has already started in AIIMS Bhopal, AIIMS Nagpur and MGM Medical College, Navi Mumbai and its result is likely to be known by the end of this year.

Uttarakhand-based Ambrosia Food Farm has initiated the translational trial using Cordyceps capsules in COVID-19 patients. "The final result of the trial will be available by December. Cordyceps immunity booster capsules are food supplement capsules. Cordyceps is a herb with immunological and anti-viral properties and the capsule has no side effects. Services of farmers are being taken for growing medicinal mushrooms and it has great potential for employment opportunities also," said Gouvendra Gangwar, Managing Director of the Ambrosia Food Farm at Nainital.

Research and Development were initiated by the Department of Pharmaceutical Sciences and Drug Research, Punjab University, Patiala. Maj. Gen. (Dr) Vibha Dutta, SM (Director and CEO, AIIMS Nagpur) and Prof. Sarman Singh (Director and CEO, AIIMS Bhopal), both laboratory physicians, are working closely with Prof. Dr. Sankalp Dwivedi (Dean and Director SSIMS, Bhopal), who serves as the Chief Medical Advisor for the trial.

thehindubusinessline.com/news/clone-deals-mushroom-based-nutraceutical-shows-promise-against-coronavirus/article329

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### News

## Clone Deals' Mushroom-based nutraceutical shows promise against Coronavirus

Our Bureau | Hyderabad | Updated on October 22, 2020 | Published on October 22, 2020

Clone Deals, a Hyderabad based start-up incubated at Atal Incubation Centre-Centre for Cellular and Molecular Biology (AIC-CCMB), has developed 'CoronaAid' a novel nutraceutical to boost immunity against Covid- 19.

nuffoodsspectrum.in/news/26/7409/clone-deals-unveils-mushroom-derived-food-supplement-to-fight-cov

How Diagnostic & Lab Information Management

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NUTRITIONALS DIETARY SUPPLEMENTS ALLIED INDUSTRY REMEDIES SUPPLIER TECHNO

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Home / Dietary Supplements / Clone Deals unveils mushroom derived food supplement to fight COVID-19

### Clone Deals unveils mushroom derived food supplement to fight COVID-19

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28 October 2020 | News

The COVID-combating food supplement is a combination of Cordyceps militaris and curcumin

## AIIMS takes up the translational trial for using Cordyceps Capsules for treatment in COVID-19

TIT Correspondent  
info@impressivetimes.com

**NEW DELHI:** Efforts and trials are going on for preparing preventive and curative medicine for Corona. Ambrosia Food Farm Co. Bhowali Nainital, Uttarakhand has initiated the landmark translational trial using Cordyceps capsules in COVID-19 patients. The first trial has already started and its result will be known by the end of this month. Addressing a press conference in New Delhi today, the Managing Director of the Ambrosia Food Farm Company, Mr. Gouvendra Gangwar said that the final result of the trial will be available by December. Cordyceps immunity booster capsules are food supplement capsules.

Cordyceps is a herb with immunological and anti-viral properties and capsule has no side effects. Services of farmers are being taken for growing medicinal mushroom and it has great potential for employment opportunities also. Mr. Gangwar said that we are making all efforts and hope to bring out the medicine for the cure of Corona by December this year. This will be our contribution towards 'Corona Mukta Bharat' and 'Atma-Nirbhar Bharat'. The approval for the trial has already been obtained from the regulatory bodies, he said. Research and Development Coordinator of Ambrosia Food Farm Co., Mr. Vikas Vinod Tiwari said that Initial investigations, which include computational analysis, were initiated by Dr. Om Silakari (Department of Pharmaceutical Sciences and Drug Research, Punjab University, Patiala). These studies showed promising results and formed the foundation for this trial, which was structured by Dr. Mohini Barde from Med Indite Communication Pvt. Ltd. in partnership with the multi-center research team across India. The Ambrosia Leadership led by Mr. Gouvendra Gangwar, Mr. Shailendra Singh and Mr. Vikas Vinod Tiwari, remain optimistic and committed to the potential positive effects of Cordyceps capsule in COVID-19 patients. The clinical trial is an example of bridging scientifically the traditional medicine with modern medicine as envisioned by the Prime Minister, Mr. Narendra Modi. The vibrant research team is led by Prof. Sidharth P. Dubhashi from AIIMS Nagpur, which includes Dr. Sagar Sinha, Dr. Jaishree Ghanekar, Dr. Sameer Kadam and Dr. Parineeta Samant from MGM Medical College, Navi Mumbai along with Dr. Amit Agarwal from AIIMS Bhopal. Maj. Gen. (Dr) Vibha Dutta, SM (Director and CEO, AIIMS Nagpur) and Prof. Sarman Singh (Director and CEO, AIIMS Bhopal), both laboratory physicians, are working closely with Prof. Dr. Sankalp Dwivedi (Dean and Director SSIMS, Bhopal), who serves as the Chief Medical Advisor for the trial. This trial will bring together clinical, basic sciences and traditional researchers on a single platform to combat COVID-19. This is a path defining moment for India, which scientifically relates traditional medicine with modern medicine.

**Managing Director of the Ambrosia Food Farm Company, Mr. Gouvendra Gangwar and his colleagues displaying the packets of Cordyceps capsules at the press conference in New Delhi**

**ADDRESSING A PRESS CONFERENCE IN NEW DELHI TODAY, THE MANAGING DIRECTOR OF THE AMBROSIA FOOD FARM COMPANY, MR. GOUVENDRA GANGWAR SAID THAT THE FINAL RESULT OF THE TRIAL WILL BE AVAILABLE BY DECEMBER**

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## Hyderabad Startup Develops Mushroom-Based Immunity Booster Against COVID-19

By source - October 22, 2020



Hyderabad Startup Develops Mushroom-Based Immunity Booster Against COVID-19

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# Mumbai Mirror

Fri, Oct 30, 2020 BANGALORE MIRROR | AHMEDABAD MIRROR | PUNE MIRROR

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HOME / CORONAVIRUS OUTBREAK / COVID-19: CCMB-BACKED START-UP CLAIMS MAKING IMMUNITY BOOSTER WITH HIM

## Covid-19: CCMB-backed start-up claims making immunity booster with Himalayan mushrooms

By P Pavan / Updated: Oct 22, 2020, 19:21 IST

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Hyderabad: A start up supported by the Hyderabad-based Centre for Cellular and Molecular Biology (CCMB) has developed a nutraceutical to boost immunity against Covid-19. The food supplement is made from a mushroom, Cordyceps militaris, that grows in the Himalayan region and is known for its immune-boosting and anti-oxidant components.

The start up, Clone Deals, supported by the CCMB through its Atal Incubation Centre (AIC - CCMB), named the nutraceutical 'CoronAid' and claimed that it would be promising in boosting immunity against the virus.

Cordycepin in the mushroom powder is known to prevent formation of new DNA and RNA strands. Clone Deals has collaborated with scientists from CCMB to establish the potency of cordycepin in stopping the growth of the Covid-causing strain in a cell-culture system. The studies show that cordycepin inhibits multiplication of the virus.

DH DECCAN HERALD

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## CCMB-incubated Hyderabad startup supplement claims to boost immunity against Covid-19

The food supplement is made from a mushroom type, Cordyceps militaris, which grows in the Himalayan region

Prasad Wilchenametta, DHNS, Hyderabad, OCT 22 2020, 22:07 IST | UPDATED: OCT 22 2020, 22:07 IST



Representative image Credit: AFP Photo

A startup incubated at the Centre for Cellular and Molecular Biology in Hyderabad has developed 'CoronAid' a novel nutraceutical claimed to boost immunity against Covid-19.



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