RESEARCH ARTICLE

Comparative Evaluation of Dynamic Photosynthetic Performance of Plants by Chlorophyll Fluorescence related Parameters in and outside of Agnihotra Atmosphere

Harshita Singh[1], Shashi B. Agrawal[1], Madhoolika Agrawal[1], Ulrich Berk[2*]

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Abstract

Agnihotra is a Vedic method to purify the atmosphere and the whole environment and bring Nature back to Harmony. It is the simplest and basic Yajnya tuned to the biorhythm of sunrise and sunset. This study has evaluated the physiological performance of 14 plants (11 trees, 1 shrub, and 2 crops) that are present in a place where Agnihotra has been regularly performed to that of a place where it is not performed. Both places had regular anthropogenic interferences. It is inferred that the Agnihotra atmosphere contributed positively to the morphological development (leaf area) and physiology (chlorophyll a fluorescence-related parameters) of the studied plants.

Keywords: Vegetation, Morphology, Physiology, Agnihotra, Air pollution.

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[1]Laboratory of Air Pollution and Global Climate Change, Department of Botany, Institute of Science, Banaras Hindu University, Varanasi, India.

[2]German Association of Homa Therapy

***Corresponding author:** Ulrich Berk, German Association of Homa Therapy, Email: dr.ulrich.berk@homatherapie.de

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Introduction

Environmental pollution is one of the biggest problems of our time that affects all life forms from animals to plants. Plants are also under extreme stress from the environment; however, studies typically consider the effects on human health. Stress caused by different anthropogenic environmental stimuli restricts the photosynthesis of trees and other plants in the near vicinity. The prominent soil stresses include nutrient and water insufficiency (Pereira *et al.,* 1992; Morales *et al.,* 2000; Marsal and Girona, 1997); flooding and compaction of soil (Day *et al.,* 2000) and soil contamination (Percival *et al.,* 1998). Additionally, climatic stress factors including limited or excessive solar irradiation (Sullivan and Teramura, 1994; Zeuthen *et al.,* 1997), wind speed (Clark *et al.,* 2000 b), and air pollutants like ozone (Clark *et al.,* 2000a) combine to harm the health of trees.

On the other hand, there is one farming method called Homa Organic Farming with Agnihotra as its basic tool (a fire performed at the exactly same time of sunrise and sunset in a copper pyramidal vessel of fixed size and shape) which is said to help mitigate environmental pollution (Paranjpe, 1989; Berk, 2020). A short description of the method is given in the annexure at the end of this article.

Photosynthesis, one of plants' most important metabolic processes, is greatly altered by stressful environments. The photosynthetic electron transport chain consists of four major protein complexes namely, Photosystem I (PSI), Photosystem II (PSII), cytochrome (Cyt b6f) complex and ATP synthase that are in charge of transferring electrons from water to NADP+. The purpose of photosystem II (a multi-subunit complex) is to organize the chlorophylls for light collecting and to house the cofactors required for the oxidation of water as well as the intermediates of electron transport (Wydrzynski, 2008). In the grana are located most of the PSII reaction centers (RC) and their primary light-harvesting complex (LHC) II while PSI is confined in the stroma. An interdependence exists between the structural and functional components of PSII.

In order to determine the degree of damage to the photosynthetic system under various environmental stresses, the chlorophyll fluorescence technique has been widely used. It is a non-destructive, straightforward, and quick testing method (Strasser *et al.,* 2000). Chlorophyll fluorescence-based methods bring the inquiry into the rates of plant photosynthetic activity under various environmental conditions. According to Strasser *et al.* (1995), in order to evaluate the photosynthetic vitality of plants, tissues, and cells, the chlorophyll fluorescence released by PSII can be utilized as an efficient methodology. Given that PSII is one of the key stress respondents (Zeuthen *et al.,* 1997; Morales *et al.,* 2000), interpreting PSII behavior can help identify the fundamental stress consequences of urban injury on trees. Furthermore, optoelectronics' technical capabilities provide a means to infer the biophysical characteristics of samples in real-time. Fluorometric investigations often follow a method that involves detecting the origin and maximum values of fluorescence as well as computing variables like the F_v/F_m ratio.

Therefore, it is an obvious hypothesis that plants in an environment where Agnihotra is regularly performed suffer less from pollution-induced stress than those in an environment where Agnihotra is not performed. This hypothesis was tested by comparing the plants growing in a place where Agnihotra- the healing fires have been performed for 22 years and on the same plants some kilometers away with non-Agnihotra but otherwise comparable conditions. For such a test there is a need for diagnostic instruments to gauge the vitality of plants and especially of trees. Tree vitality is evaluated using analytical techniques and a visual assessment of leaf senescence.

Material And Methods

Site description and test plant details

As a place with an Agnihotra environment the Homa Therapy Goshala, covering an area of 36,422 m^2 in Maheshwar, M.P., India, was chosen to observe the effect of Agnihotra on naturally growing plants. It is situated between Maheshwar and Mandleshwar, Khargone district, Madhya Pradesh, India (75.6210 East, 22.1736 North). Agnihotra has been performed there regularly since 2001. For comparison same crops and trees were selected in a non-Agnihotra site at a distance of three to five kilometres from the Homa Therapy Goshala. The climate and soil conditions are comparable, and plants listed in Table 1 were identified for the study based on their common occurrence at both the selected sites. The selected plants were morphologically similar (trees were of the same diameter at breast height) in size and hence assumed to be of similar age.

Plant sampling and foliage morphological assessment

In each location, samples were selected arbitrarily from biological replicates (N = 3) of each species in order to reduce the local microclimatic influence. The sampling was done between 24^{th} to 28^{th} February 2023. Fully expanded leaves (n = 5) were collected between 8:00 and 10:00 h. Leaves were collected from all sides at a height of 1.5 to 2 m above the soil surface from the outer canopy of trees. The samples were sealed properly in polythene bags and brought in cold conditions for morphological assessments. Five mature and fully inflated leaves from the outer canopy were randomly selected from the three plants for the measurement of leaf area using ImageJ software (U. S. National Institutes of Health, Bethesda, MD). The visible morphological differences were assessed using the digitized images.

Chlorophyll a fluorescence transient measurement

To characterize the vitality performance of the plants, 5 fast fluorescence transients were recorded on the leaves of 3 biological replicates of each plant under study. Measurements at ambient temperature were performed with a PAR-FluorPen FP 110 (Photon System Instruments, Drásov, Czech Republic). The sample was exposed to 470 nm light from a built-in LED source into the fluorometer sensor during the experiment after a dark adaptation from ambient light for 30 minutes using a clip. In order to produce uniform irradiation throughout a 4 mm diameter leaf surface, continuous light excitation (at 3,000 mol /m^{-2} s^{-1}) was focused on the leaf surface.

Fluorescence levels F_O (50 µs), F_J (2 ms), F_I (30 ms) and F_m (F_{max}) were recorded. The OJIP transients were also translated to biophysical parameters: the quantum yield (Psi_Po); specific activities per reaction centre (RC); performance indexes (PI) and structure–function indexes (Vj, Sm and N). Radar plots were used to show the difference between the behavior patterns of stressed and control plants.

Statistical analysis

IBM SPSS Statistics Version 21.0 and Origin 2023 were used to assess the statistical significance of differences between sampled groups from different sites. All data sets were assumed to have normal distributions because the sample sizes were too small to perform a test for Gaussian distribution. Student t-test was used to compare the two groups with a reference group. Asterisks (* for p <0.05, ** for p <0.01, and *** for p <0.001) were used to indicate three different degrees of significance.

Results And Discussions

The process of photosynthesis is influenced by a variety of biotic and abiotic elements in the natural environment. These parameters mostly have an impact on the photochemistry of the photosystem. Plants have several strategies to cope with various environmental situations by altering the photosystem II apparatus (Fig. 1). In our study we have compared the physiology

Table 1: Details of the test plants selected for the study

S. No.	Plant Name	Common Name	Type	Habit	Family	Leaf type	Leaf shape
1	*Trigonella foenum-graecum*	Fenugreek	Crop	Seasonal	Fabaceae	Compound	Obovate
2	*Spinacia oleracea*	Spinach	Crop	Seasonal	Amaranthaceae	Simple	Spade
3	*Zizyphus mauritiana*	Indian jujube	Shrub	Evergreen	Rhamnaceae	Simple	Obovate
4	*Manilkara zapota*	Sapodilla	Tree	Evergreen	Sapotaceae	Simple	Elongated-elliptical
5	*Mangifera indica*	Mango	Tree	Evergreen	Anacardiaceae	Simple	Lanceolate
6	*Punica granatum*	Pomegranate	Tree	Evergreen	Lythraceae	Simple	Elliptic
7	*Murraya koenigii*	Curry Tree	Tree	Semi-evergreen	Rutaceae	Pinnate	Elongated
8	*Azadirachta indica*	Neem	Tree	Semi-evergreen	Meliaceae	Pinnate	Elongated
9	*Ficus religiosa*	Peepal	Tree	Semi-evergreen	Moraceae	Simple	Lanceolate
10	*Ficus benghalensis*	Banyan Tree	Tree	Evergreen	Moraceae	Simple	Elliptical
11	*Holoptelea integrifolia*	Chirol	Tree	Deciduous	Ulmaceae	Simple	Elliptic-ovate
12	*Butea monosperma*	Palash	Tree	Deciduous	Fabaceae	Pinnate, trifoliate	Ovoid
13	*Bauhinia variegata*	Kachnar	Tree	Deciduous	Fabaceae	Simple	bi-lobed, ovate
14	*Cassia fistula*	Amaltas	Tree	Deciduous	Fabaceae	Pinnate	Ovate

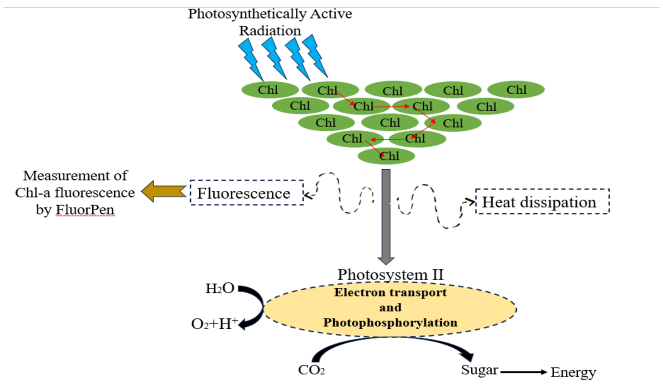
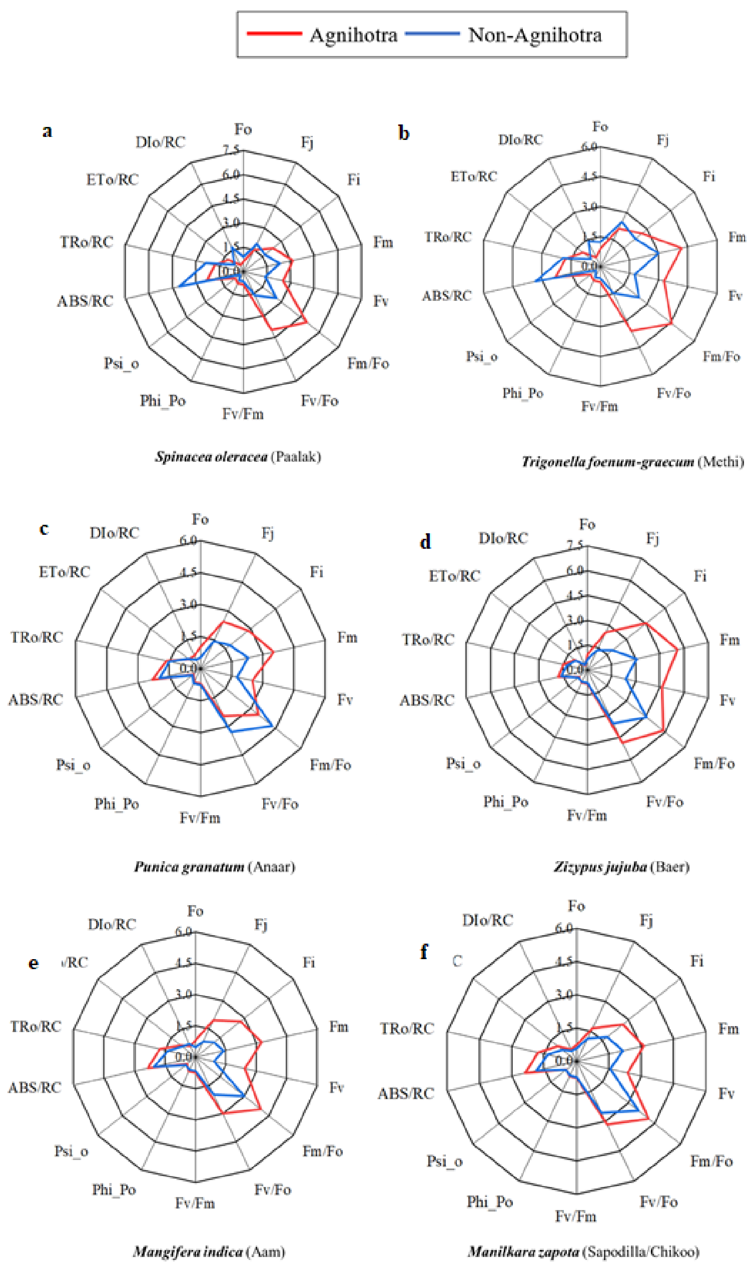


Fig. 1: Principle of chlorophyll fluorescence measurements in proportion to the amount of light stimulation and the amount of chlorophyll (Chl).

of the 14 plant species (11 trees, 1 shrub and 2 crops) growing in an urban (non-Agnihotra) environment which has regular anthropogenic activities to that growing in comparatively less polluted- Agnihotra environment. The evaluation was done using quantum yields and efficiencies, specific energy fluxes and other chlorophyll fluorescence-related parameters.

Variable fluorescence

Variable fluorescence (Fv) is reflective of the alterations in the flow of electrons through photosystems which is managed by the PS II electron acceptors redox state (Strasser *et al.*, 1995). Fv was found to be observed consistently in the plants of Agnihotra atmosphere compared to non-Agnihotra except in *A. indica* (Fig. 2g) and *M. koenigii* (Fig. 2h). Highest positive change was observed in *H. integrifolia* (255.1%) (Fig. 2k) followed by *F. benghalensis* (223.1%) (Fig. 2m) while least was found in *F.*



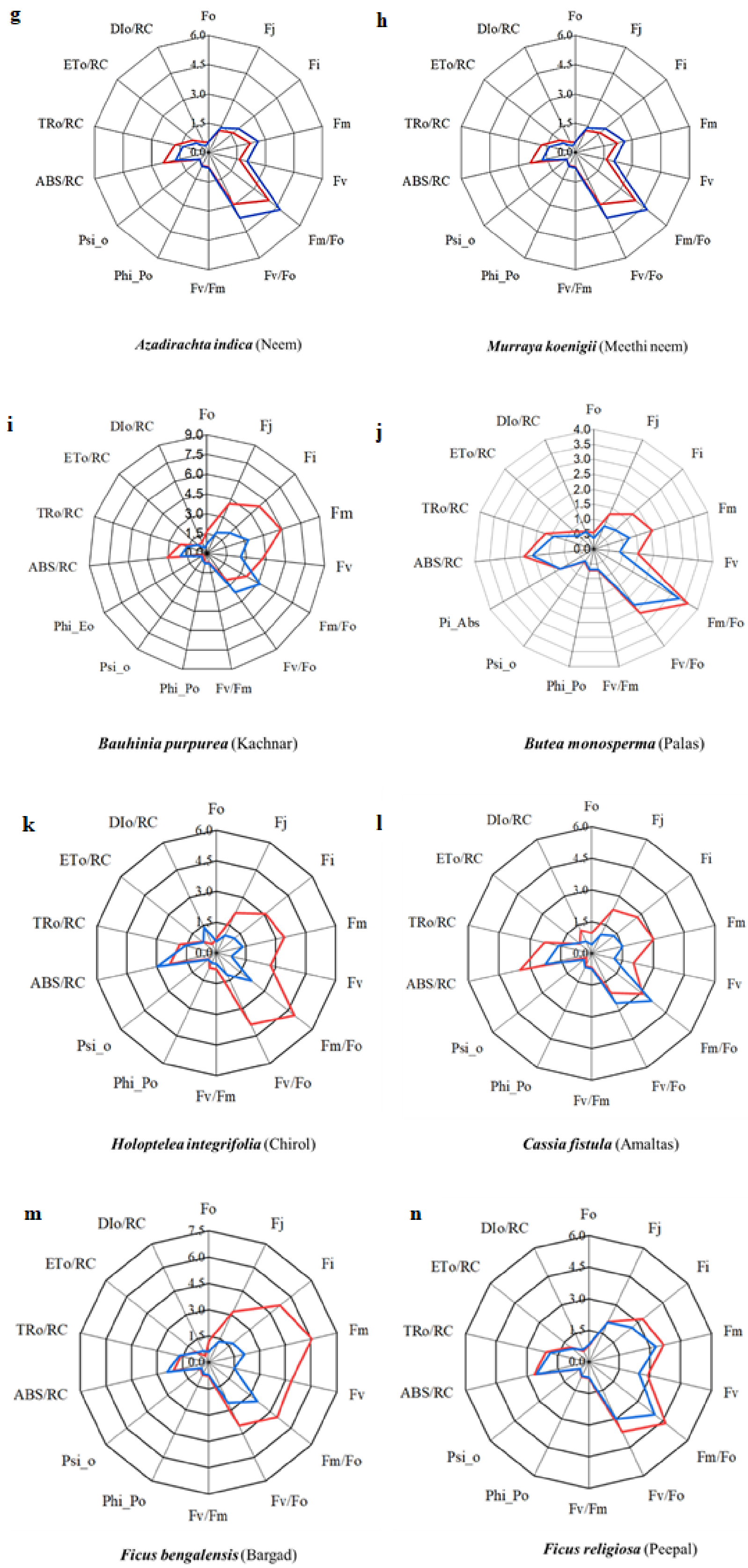


Fig. 2: Radar plot showing various JIP parameters deduced from chlorophyll a fluorescence OJIP transient curves of plants under study for two different sites (Agnihotra and non-Agnihotra). Each line represents the average five measurements per plant.

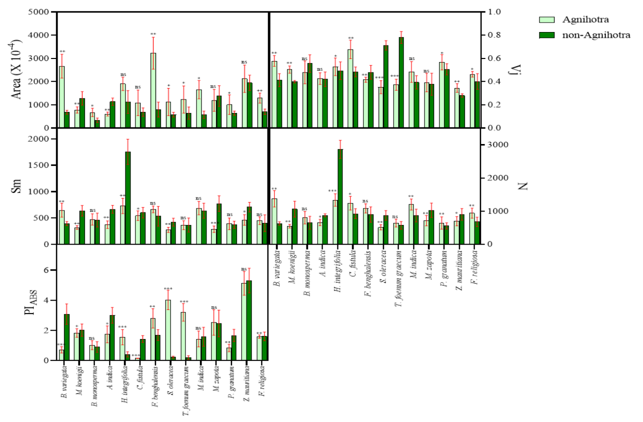


Fig. 3: Bar graph showing other chlorophyll florescence related parameters deduced from OJIP curve data.

religiosa (17.1%) (Fig. 2n**)**. A decline in Fv indicates impediment of reaction on the photoxidizing site of PSII (Martinazzo *et al.,* 2012) which was observed in the plants of non-Agnihotra atmosphere.

The protective conversion of violaxanthin to zeaxanthin, which occurs in separate processes of the xanthophyll cycle and results in non-radiative energy dissipation, is frequently linked to a drop in Fm (Janka *et al.,* 2013). Fm was comparatively higher in the plants of Agnihotra than non- Agnihotra atmosphere following the order *F. benghalensis*> *H. integrifolia*> *M. indica*> *C. fistula*> *Z. mauritiana*> *P. granatum* and it was least in *F. religiosa* (Fig. 2).

Maximal and minimal fluorescence

Fluorescence at 50µs is denoted as minimal fluorescence (F_o) when all primary quinone acceptor (Q_A) is in the oxidized state (open). F_o was found to be significantly higher in the plants of Agnihotra atmosphere. It was highest in *B. variegata* (142.11%) followed by *C. fistula* (131.8%) and lowest in *H. integrifolia* (25.5%) (Fig. 3). The value of F_o can be used as an indicator of irreversible damage caused to PS II which is associated with the LHC II separation and obstruction in the electron transfer. Maximal fluorescence (F_m) showed a significant increase in Agnihotra atmosphere compared to the non-Agnihotra (Fig. 2). The increase ranged between 11.3- 187.7% in the plants of Agnihotra atmosphere except in *M. koenigii* and *A. indica*. This increase is reflective of the efficient PS II activity while a decreased Fm of the non-Agnihotra atmosphere indicates a conformational change in D1 protein which reduces the efficiency of PS II (Goltsev *et al.,*2016; Kalaji *et al.,* 2014).

Area

It represents the total integral area that lies between the fluorescence inductive curve and Fm. A variability is observed for the area whereby it increased significantly increased in *F. benghalensis* (304.1%) followed by *M. indica* (190.2%) and *B. variegata* (161.2%) (Fig. 3). The area was also reduced in Agnihotra atmosphere plants- *A. indica* > *M. koenigii* > *F. religiosa* > *C. fistula*. The area is representative of the relative pool size of electron acceptor Q_A on the reducing side of PSII. The decrease in area reflects a hindrance in electron transfer from the reaction centers to quinone pool (Ghassemi-Golezani and Lotfi, 2015).

Structure–function indexes

Relative variable fluorescence (Vj) showed a similar trend and was increased in Agnihotra atmosphere plants except in the two crops (*S. oleracea* and *T. foenum-graecum*) and *F. benghalensis*, *B. monosperma* and *F. religiosa* (Fig. 3). The lower value of the Vj in non-Agnihotra plants indicates the affected electron transfer at the PSII donor end (Strasser *et al.*,1995).

Complementary area (Sm) declined in most of the plants of Agnihotra atmosphere following the order *C. fistula*> *A. indica*> *H. integrifolia*> *M. koenigii*> *Z. mauritiana*> *F. religiosa* (Fig. 3). Sm is an indicator of electron transport pool between PSII and PSI whereby its decline represents increase in electron transport between these photosystems (Stirbet and Govindjee, 2011). The turnover number (N) decreased in most of the species of Agnihotra compared to non-Agnihotra atmosphere while increased in *B. variegata*> *M. zapota*> *M. indica*> *B. monosperma*> *P. granatum* (Fig. 3).

Quantum Yield

Quantum yield (Fv/Fm) or Psi_Po is suggestive of the yield of chlorophyll fluorescence which in turn suggests the alterations in the efficiency of photochemistry and heat dissipation (Martinazzo *et al.,* 2012; Janka *et al.,* 2013). Among the studied plants, those in the Agnihotra atmosphere showed higher photosynthetic efficiency based on their Fv/Fm. The highest increase was observed in *H. integrifolia* while the least was in *B. monosperma* and *M. zapota* (Fig. 2). This increase in the photosynthetic efficiency as it produces ions and energy that have beneficial effects on the environment through the unique sonic waves of the mantras (Sharma and Ayub, 2019). During the process of Agnihotra, there is a slow combustion process that releases a low concentration of CO_2 which doesn't impose any threat to the environment. This slight increase of CO_2 in the ambiance of Agnihotra proves beneficial for the vegetation as it serves as the primary raw material for photosynthesis and hence, strengthens the CO_2 cycle.

Performance index

The performance index (PI_{ABS}) was observed to be higher in most of the studied plants in the Agnihotra atmosphere except *B. variegate*, *A. indica*, *C. fistula* and *P. granatum* (Fig. 3). The PI_{ABS} combines the density of RCs in chlorophyll, the conversion of excitation energy to electron transport, and the transfer of excitation energy to trapping into a single parametric step (Strasser *et al.,* 2004). This indicates that there are a higher number of active RCs in the plants of Agnihotra atmosphere.

Specific energy fluxes

The specific energy fluxes include ABS/RC, TRo/RC, ETo/RC and DIo/RC were reported to be lower in the plants of non-Agnihotra compared to Agnihotra atmosphere. ABS/RC was higher in Agnihotra plants except in both the crop plants and *F. benghalensis*, *H. integrifolia* and *M. koenigii* (Fig. 2). TRo/RC showed a consistent increase in the plants of Agnihotra with an exception of the crop plants under study. ETo/RC was also increased in Agnihotra plants except *M. koenigii*, *C. fistula*, *B. variegata* and *P. granatum* (Fig. 2). Most of Agnihotra plants showed decline in DIo/RC with an exception of *B. variegata*, *B.*

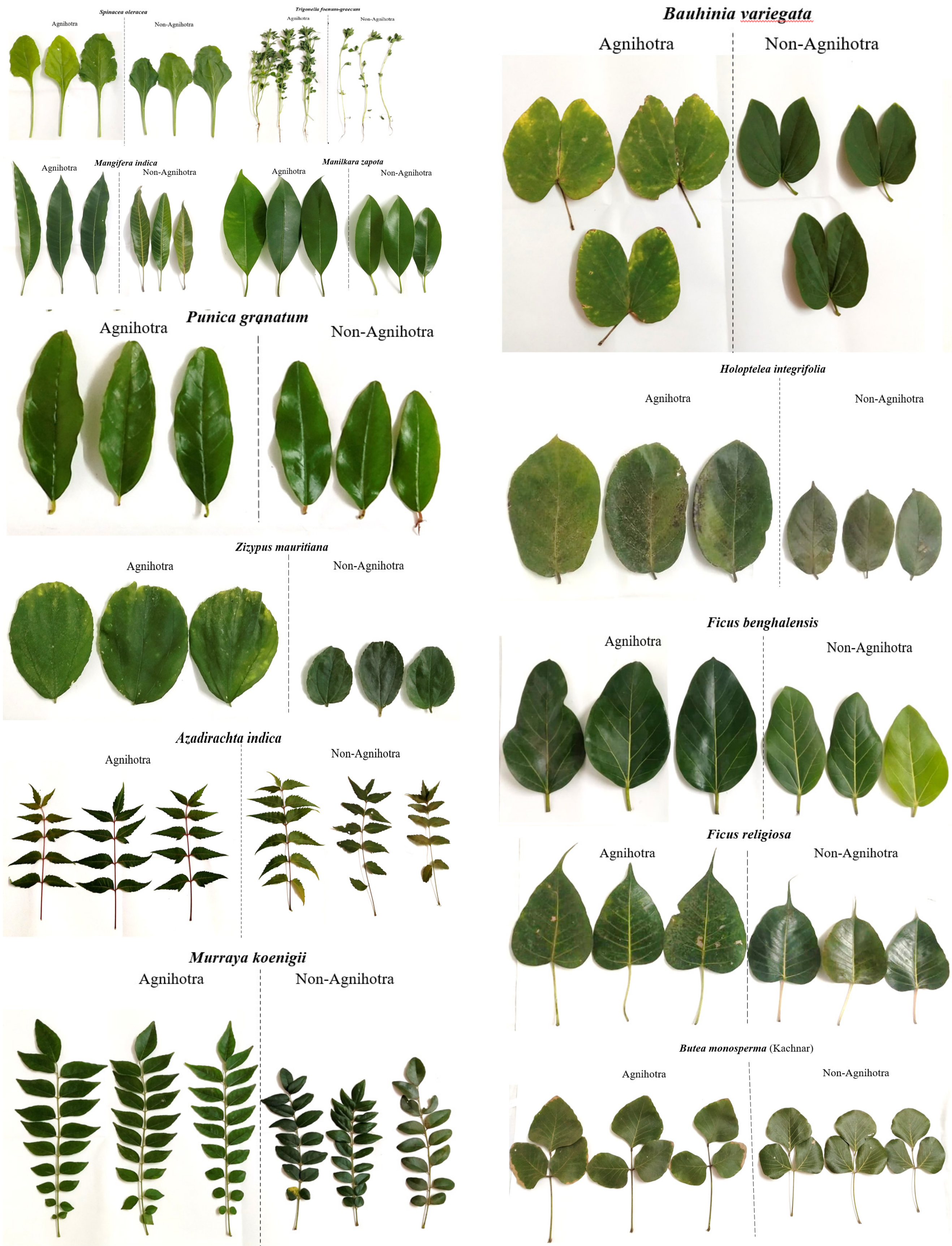


Fig. 4: Comparative leaf morphology of the studied plants at Agnihotra and non-Agnihotra atmosphere.

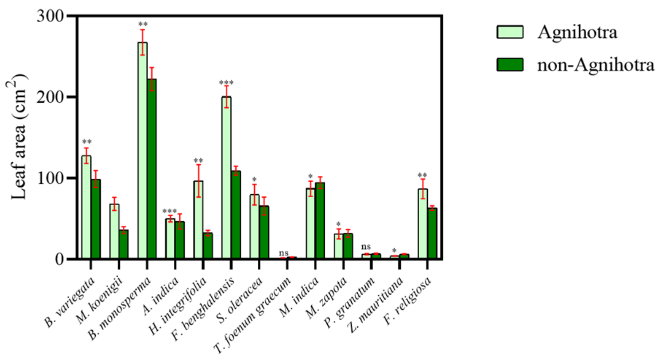


Fig. 5: Leaf area of the plants under study at both the sites.

monosperma, *A. indica*, *C. fistula*, *M. zapota* and *P. granatum* (Fig. 2). There are studies that have established marked reduction in the particulate matter (PM), Sulphur and Nitrogen oxides of the areas where Agnihotra is regularly performed (Saxena *et al.,* 2018). It is also established that when used in conjunction with plants during oblation during a yagna, ghee may have volatilized into very small droplets, causing PM to adhere to their surface. Then, it can adhere to the soil or another surface there. This decline in the PM concentration is observed for a persistent period following the Agnihotra (Saxena *et. al.,* 2018). It is therefore inferred that in the Agnihotra atmosphere more photosynthetically active radiation is available and hence the efficiency of the plants is higher which is in turn reflected from the higher ABS/RC values. It indicates more active RCs while lower values at non-Agnihotra atmosphere shows a decreased ability of RCs to reduce plastoquinone (Grieco *et al.,* 2015).

Leaf morphology

It is evident from the images in Fig. 4 that the plants of the Agnihotra atmosphere had better morphology along with larger leaf areas compared to non-Agnihotra (Fig. 5). It is well established that the leaf area is reduced on exposure to adverse environmental conditions especially in the areas with higher air pollutant concentrations (Singh *et al.,* 2023). The leaf area increased maximally in *H. integrifolia* followed by *M. koenigii* and minimum in *A. indica*. The leaves showed no symptoms of the disease at Agnihotra atmosphere which can be attributed to the products of combustion, mainly formaldehyde, which is a potent antiseptic. It is produced by the partial oxidation of hydrocarbons and the degradation of complex organic compounds during Agnihotra (Sharma and Ayub, 2019). The Agnihotra fumes adversely affect the insects are and they are driven away or killed. Plant life is protected against these harmful organisms by the aromatic compounds that are disseminated in the air by Agnihotra thereby creating a favorable atmosphere for the growth of vegetation (Sharma and Ayub, 2019).

Conclusion

The study focuses on the effect of the Agnihotra atmosphere on the dynamic photosynthetic performance of the vegetation by comparing the same aspects of the vegetation of a nearby area. It has been observed that plants of the family Fabaceae, Meliaceae and Lythraceae were less responsive towards the Agnihotra atmosphere as compared to other families in the Agnihotra atmosphere. Based on our analysis, we conclude that the Agnihotra atmosphere improves the efficiency of PSII by reducing its damage and assisting the repair and protective processes. The Agnihotra has a significantly positive impact on the photochemical efficiency and morphology of the vegetation. It was also observed that the plants in the Agnihotra atmosphere had a greater number of active reaction centers. They also had significantly higher leaf area which is a demarcation of low pollutant load in the ambience.

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Authors Contribution

H.S. Conceptualization, Visualization and Original draft writing; S.B.A.- Visualization and Editing, M.A.- Editing and Supervision; U.B.- Writing, Editing and Supervision. All authors read and approved the final manuscript.

Conflict Of Interest

The author declares that there is no conflict of interest

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Supplementary Information

What Is Agnihotra?

Based on the description given in Berk and Johnson (2009), Agnihotra is the basic healing fire of HOMA Therapy, is a small fire prepared in a copper pyramid exactly at sunrise and sunset each day. Agnihotra can neutralize the effects of pollution on plants, animals and human beings and at the same time give nourishment.

GHEE (clarified butter): Take some butter from cow's milk, which has no additives and is pure. Heat it on low heat. After the water has evaporated and white solids have risen to the top pass the liquid through a fine strainer. What passes through is clarified butter (Ghee). This can last without refrigeration for a long time. Ghee is a very special medicinal substance. When used in Agnihotra fire it acts as a carrier agent for subtle energies. Powerful energy is locked up in this material.

TIMINGS: Agnihotra is practised exactly at sunrise and sunset each day. Computer- generated timetables are available for any place using software developed in Germany.

Agnihotra Procedure

A few minutes before the actual time of sunrise and sunset you should start to prepare the Agnihotra fire as follows:

Materials Required For Agnihotra

Pyramid: For Agnihotra you require a copper pyramid of specific size. Copper is a conductor for subtle energies also.

RICE: Brown rice. Highly polished rice loses nutritional value and hence low polished rice. Only unbroken pieces of rice should be used for Agnihotra. If rice is broken the subtle energy structure around the material is disturbed and hence is not fit for Agnihotra healing fire.

Dried Cow Dung: Take dung from male or female progeny of a cow. Make pancake-like patties and dry them in sun. Agnihotra fire is to be prepared from this dried cow dung.

Cow dung is treated as medicine in all ancient cultures whether they be Indians of North or South America, Scandinavians, East or West Europeans, Africans or Asians.

Fig. 1: Materials used in Agnihotra

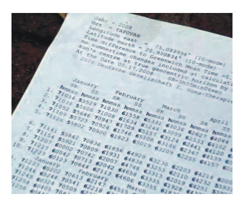

Fig. 2: Agnihotra time table for a given location.

Place a flat piece of dried cow dung at the bottom of the copper pyramid. Arrange pieces of dried cow dung in the pyramid in such a manner as will allow air to pass. Apply a little Ghee to a small piece of cow dung and light it. Insert this lighted piece of cow dung in the middle of the pyramid. Soon all the dung in the pyramid will catch fire. You may use a hand fan to blow the

Agnihotra Mantras

At Sunrise

sooryáya swáhá sooryáya idam na mama
Add the first portion of rice after Swáhá.
Prajápataye swáhá prajápataye idam na mama
Add the second portion of rice after Swáhá.

At Sunset

Agnaye swáhá agnaye idam na mama
Add the first portion of rice after Swáhá.
prajápataye swáhá prajápataye idam na mama
Add the second portion of rice after Swáhá.

air and help the flame. However, do not blow on the fire so as to avoid bacteria from the mouth affecting the fire.

Do not use any mineral oil or similar material to start the fire. At sunrise and sunset the fire should be ablaze in the pyramid. You take a few grains of rice in a dish or your left palm and apply a few drops of ghee to them.

Exactly at sunrise utter the first Mantra and after the word SWAHA add a few grains of rice (as little as you can hold in the pinch of your fingers will suffice) to the fire. Utter the second Mantra and after the word SWAHA add a few grains of rice to the fire. This completes morning Agnihotra.

At sunset do the same by using evening Mantras. This completes evening Agnihotra.

If you miss the timing it is not Agnihotra and you will not get the healing effect on the atmosphere or in the ash.

After each Agnihotra try to spare as many minutes as you can for meditation. You can sit at least till the fire extinguishes itself. Agnihotra creates medicinal and healing atmosphere.

Just before the next Agnihotra collect the ash and keep it in a glass or earthen container. It can be used for plants or making folk medicines.

Mantras For Homa Therapy

There are vibrations that exist every-where. It is only vibrations when you go into it. Where there is vibration there is also sound. When we do these Mantras, the sounds we utter activate these special vibrations that will create certain atmosphere of effects. Then the desired results are realised. These vibrations exist for everything, so anything can be activated, controlled or changed by Mantras.

Agnihotra should be performed every day at sunrise and sunset. If you miss the time it is not Agnihotra and you will not get the effects.

Exact sunrise/sunset timings (seconds' accuracy) you can get online by just entering your address at: https://www.homatherapie.de/en/Agnihotra_Zeitenprogramm.html.

Also there is an app available for both Android phones and iPhones called Agnihotra Buddy.

You will find the link on the same webpage.

How Does Agnihotra Work?

The sun brings or takes the energy, which makes all conditions conducive to an anti-pollutionary change (Fig. 3). It calms the world. The pyramid is the generator, the fire, the turbine.

Just at morning Agnihotra all the electricities, energies, ethers are attracted to the pyramid in its shape. At sunset these energies are thrust out in same shape. This flood of energies at

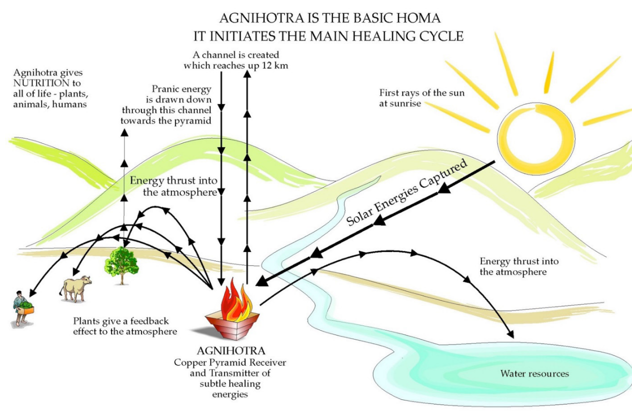

Fig. 3: Details of Agnihotra

Table 1: Abbreviations used in the study

Technical parameters		
Fluorescence intensity at 50µs	F_o	
Maximal fluorescence intensity	F_m	
Variable fluorescence	F_V	$= F_m - F_o$
Relative variable fluorescence at 2 ms	V_J	$= (F_{2ms} - F_o)/(F_m - F_o)$
Relative area between F_m and F_t	Sm	$= {}_{Fo}\int^{Fm} (F_m - F_t)/(F_m - F_o)dt$
Absorption per RC	ABS/RC	$= (M_o/V_j)/(1 - F_o/F_m)$
Trapping at time zero, per RC	TRo/RC	$= M_o/V_J$ = (ABS/RC) Phi_Po
Dissipation at time zero, per RC	DIo/RC	= (ABS/RC)–(TRo/RC)
Electron transport at time zero, per RC	ETo/RC	= (TRo/RC) $Psi_{\_O}$
Maximum quantum yield of primary photochemistry	Phi_Po	= TRo/ABS = $(F_m - F_o)/F_m$
		$= 1 - (F_o/F_m)$
Probability that a trapped exciton moves an electron further than Q_A^-	Psi_o	= ETo/TRo = $1 - V_J$
Performance Index	PI_{ABS}	= [RC/ABS][Phi_Po/(1–Phi_Po)] [Psi_o /(1 –Psi_o)]

sunrise creates strong purifying effects on all levels wherever it touches the Earth.

Agnihotra amplifies these purifying effects in the following way:

This flood of subtle energies carries music with it. The morning Agnihotra Mantra is the quintessential sound of that flood.

If you then prepare the fire in the prescribed copper pyramid, utter these mantras and offer the rice mixed with ghee to the fire, then a channel is being created through all the atmosphere and PRANA - life energy, is purified.

Tremendous amounts of energy are gathered around the Agnihotra copper pyramid just at Agnihotra time. The pyramid is the generator, the fire, the turbine. A magnetic type field is created, one which neutralises negative energies and reinforces positive energies.

When Agnihotra fire is burnt there is not just energy from the fire. The rhythms and Mantras generate subtle energies which are thrust into the atmosphere by fire. Also consider the quality of materials burnt wherein lies the full effect of this healing HOMA.

Much healing energy emanates from the Agnihotra pyramid.

An aura energy field is created around plants during Agnihotra. Thus plants become stronger and disease resistant.

When the flame dies the energy is locked in the resultant ash. This ash is used for preparing various folk medicines.

Therefore, by regular performance of morning and evening Agnihotra, you create a positive energy pattern on all levels.