



International Journal of Homoeopathic Sciences

E-ISSN: 2616-4493

P-ISSN: 2616-4485

www.homoeopathicjournal.com

IJHS 2023; 7(3): 307-312

Received: 15-06-2023

Accepted: 21-07-2023

Dr. Jayashree Nanda

Reader, Department of
F.M.T., Dr. Abhin Chandra
Homoeopathic Medical College
and Hospital, Bhubaneswar,
Odisha, India

Dr. Sujata Choudhury

Research Officer (H), Scientist-
2, Drug Proving Research
Unit, Bhubaneswar under
Central Council for Research in
Homoeopathy, New Delhi,
Ministry of AYUSH, Govt. of
India, India

Corresponding Author:

Dr. Jayashree Nanda

Reader, Department of
F.M.T., Dr. Abhin Chandra
Homoeopathic Medical College
and Hospital, Bhubaneswar,
Odisha, India

Constitutional homoeopathic treatment of scrub typhus fever: A case report

Dr. Jayashree Nanda and Dr. Sujata Choudhury

DOI: <https://doi.org/10.33545/26164485.2023.v7.i3e.928>

Abstract

Scrub typhus is a rickettsial zoonotic disease and caused by *Rickettsia tsutsugamushi* whose reservoir is trombiculid mite. It is an acute illness characterised by fever, chill, headache, malaise, rash, prostration, generalised swelling of lymph nodes. The larval stage feeds the hosts (humans and rodents) and cause infection. There is no direct transmission from person to person. As an acute illness it can be successfully treated. But at times complications like multi organ dysfunction may occur. In this present case Homoeopathy plays an important role in treatment of scrub typhus fever after failure of antibiotics treatment. A 32 year old female patient presented with the symptoms of fever for 15 days which had come initially with chilliness and fever and ended after sweating with severe myalgia and headache. Later rashes appeared with itching of whole body associated with fever. ICT for malaria parasite was negative and scrub typhus IgM was positive which confirm the diagnosis of Scrub Typhus infection. A detailed case history of the patient was taken and totality of symptoms was built up. After repertorization *Arsenicum album* was prescribed in 50 millesimal potency first which initially reduced the symptoms but failed to complete cure. Later on depending upon acute totality *Psorinum* was prescribed in fifty millesimal potency to which the patient responded well. Scrub Typhus Antibody Rapid Test became negative within two months. Homoeopathic medicine *Psorinum* was prescribed basing upon reportorial totality and it was found effective in this case.

Keywords: Scrub typhus, multi-organ failure, serological assays, homoeopathy

Introduction

Scrub typhus is a zoonotic disease and the causative agent is *Rickettsia tsutsugamushi*. The true reservoir of the infection is the trombiculid mites and their small mammals like field mice, rats, etc. It is an acute infection and transmitted through the bites of infected larval mites. Scrub typhus is endemic in Northern Japan, South East Asia, the Western Pacific Islands, Eastern Australia, China, etc. Most travel acquired cases of scrub typhus occur during visit to rural areas in endemic countries for activities such as camping, hiking or rafting. The disease is not directly transmitted from person to person. The infection is maintained in the nature transovarially from one generation of mite to the next. The adult stages do not feed on vertebrate hosts. The larva feed on vertebrate hosts ^[1].

Its onset is acute with chills and fever, headache, malaise, prostration and a macular rash appearing around the 5th day of illness. Generalised lymphadenopathy and lymphocytosis are common. One typical feature is the punched-out ulcer covered with a blackened scab called as 'eschar' which indicates the location of mite bite. The rash disappears by 14th day. Complications like prostration, pneumonia, cough, delirium, deafness, cardiac failure and renal failure and haemorrhage may develop. Hepatitis and thrombocytopenia usually appear after fever. The recovery process is slow. The pyrexia falls by lysis in the 3rd week in untreated cases ^[1, 2, 3].

Routine blood investigations are not confirmatory tests for scrub typhus. Diagnosis is confirmed by clinical symptoms and antibody detection or PCR. The Weil Felix reaction is strongly positive which is the main diagnostic criteria ^[1, 3]. The gold standard diagnostic test for rickettsial disease is Micro-immunofluorescence assay (M-IFA). Rapid bedside tests which are currently available, are based on serological methods ^[4, 5].

As there is no vaccine against Scrub typhus infection, steps may be taken to avoid the infection like basic hygiene, bathing, regular changing cloths, maintaining safe distance from wild animals like rats, flying squirrels, etc. which are known to carry typhus ^[6].

In present time the sufficient supportive evidences are lacking on effective treatment of scrub typhus by different broad spectrum antibiotics.

Doxycycline and tetracycline are the commonly used antibiotics whose cure rate is very less. So, the time requires more research studies on scrub typhus in India regarding its epidemiology, pathogenesis, diagnosis and treatment [7]. Likewise there is also almost no research study in Homoeopathy for scrub typhus fever though it has significant mortality rate or severe complications when antibiotics are failed.

Here we intend to discuss about a female patient suffering from scrub typhus fever and rashes which was treated with constitutional homoeopathic medicine in the OPD of Dr. A. C. Homoeopathic Medical College & Hospital, Bhubaneswar, Odisha. Medicine was prescribed on the basis of totality of symptoms of the patient. The dose and potency selection with repetition of the medicine were done according to the homoeopathic principles.

Case Report

A female patient aged 32 years of age reported in the OPD

of the hospital attached to Dr. A.C. Homoeopathic Medical College, Bhubaneswar, Odisha on 02-07-2021, having complaint of fever since fifteen days. Fever comes on alternate days first, then came every day between 11am to 2pm and continued for whole night. Fever came with chilliness, aching pain in whole body, flushed face, nausea, followed by increase in temperature up to 104°F towards midnight. It was subsided after sweating towards morning. On exposure to open air she had caught cold easily, with sneezing and burning pain in nose and throat. She was a chilly patient with less thirst. Mentally she was irritable, restless and nervous. Before this treatment, she had taken two times antibiotics for fever but did not get any relief. On general examination pulse was 110/min., B.P. was 134/90 mm of Hg. No oedema or jaundice.

Investigation- Report of Blood- 30.06.2021-[Fig1]

Hb-11.9, T.R.B.C.- 3.87mill/cumm, T.W.B.C.- 8300/cumm, D.C.in %-N-66, L-28, E-2, M-4. ESR- 32 mm/1sthr.

ACCESSION NO :	0310UF011177	AGE :	30 Years	SEX :	Female	DATE OF BIRTH :	
DRAWN :	30/06/2021 09:07	RECEIVED :	30/06/2021 09:04	REPORTED :	30/06/2021 12:36		
REFERRING DOCTOR :	SELF			CLIENT PATIENT ID :			
Test Report Status	Final	Results		Biological Reference Interval		Units	
HAEMATOLOGY							
CBC-5, EDTA WHOLE BLOOD							
BLOOD COUNTS							
HEMOGLOBIN	11.9	Low	12.0 - 15.0			g/dL	
RED BLOOD CELL COUNT	3.87		3.8 - 4.8			mill/ μ L	
WHITE BLOOD CELL COUNT	8.3		4.0 - 10.0			thou/ μ L	
PLATELET COUNT	227		150 - 410			thou/ μ L	
RBC AND PLATELET INDICES							
HEMATOCRIT	35.1	Low	36 - 46			%	
MEAN CORPUSCULAR VOLUME	91.0		83 - 101			fL	
MEAN CORPUSCULAR HEMOGLOBIN	30.6		27.0 - 32.0			pg	
MEAN CORPUSCULAR HEMOGLOBIN CONCENTRATION	33.8		31.5 - 34.5			g/dL	
RED CELL DISTRIBUTION WIDTH	12.9		11.6 - 14.0			%	
MEAN PLATELET VOLUME	9.9		6.8 - 10.9			fL	
WBC DIFFERENTIAL COUNT - NLR							
NEUTROPHILS	66		40 - 80			%	
ABSOLUTE NEUTROPHIL COUNT	5.48		2.0 - 7.0			thou/ μ L	
LYMPHOCYTES	28		20 - 40			%	
ABSOLUTE LYMPHOCYTE COUNT	2.32		1.0 - 3.0			thou/ μ L	
NEUTROPHIL LYMPHOCYTE RATIO (NLR)	2.4						
EOSINOPHILS	02		1 - 6			%	
ABSOLUTE EOSINOPHIL COUNT	0.17		0.02 - 0.50			thou/ μ L	
MONOCYTES	04		2 - 10			%	
ABSOLUTE MONOCYTE COUNT	0.33		0.2 - 1.0			thou/ μ L	
BASOPHILS	00		0 - 2			%	
ABSOLUTE BASOPHIL COUNT	0	Low	0.02 - 0.10			thou/ μ L	
DIFFERENTIAL COUNT PERFORMED ON: EDTA SMEAR							
ERYTHRO SEDIMENTATION RATE, BLOOD							
SEDIMENTATION RATE (ESR)	32	High	0 - 20			mm at 1 hr	

Fig 1: Complete Blood count on 30-06-21

After taking the case the general and particular symptoms were analysed and evaluated according to their intensities. The totality of symptoms was constructed considering the characteristic mental generals, physical generals, particulars

basing upon diagnosis. After erecting the totality [Table-1] repertorisation was done with Homopath classic software [8].

Table 1: Symptoms forming the Totality

Sl. No.	Symptoms
1.	Mentally Irritable
2.	Restlessness, nervousness
3.	Chilly patient
4.	Catches cold easily
5.	Thirst less
6.	Fever in forenoon, with chilliness
7.	Whole body pain with fever
8.	Burning of throat and nose
9.	Sneezing more in morning
10.	Fever ends after sweating

Normal
Repertorisation

		Totality Symptoms Covered														
		Ars	Sil	Kali-c	Sulph	Puls	Rhus-t	Lyc	Nit-ac	Sep	Caust	Nat-m	Calc	Cham	Nux-v	Ph-ac
[C] [Mind]Irritability:		19	18	17	17	17	16	16	16	16	15	15	14	14	14	14
[C] [Mind]Restlessness, nervousness:Tendency:		9	8	8	8	7	9	8	7	7	7	7	6	6	6	6
[C] [Generalities]Heat:Vital, lack of:		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
[C] [Generalities]Cold:Tendency to take, taking cold agg.:		3	3	2	3	3	3	2	3	2	2	2	3	2	2	2
[C] [Stomach]Thirstlessness:		2	3	3	2	2	2	3	3	3	1	3	3	3	3	2
[C] [Fever, Heat]Forenoon:Chilliness, with:		2	1	2	1	3	1	2	2	2	1	1	1	2	1	3
[C] [Fever, Heat]Pain:With:		1	1	1	1									3		
[C] [Fever, Heat]Perspiration:Amel.:		1					1	1								
[C] [Nose]Sneezing:Morning:		1	1	1	3	2	1	1	1	2	3	2	1		2	
[C] [Nose]Pain:Burning:		3	3	2	2	2	1	1	2	1	2	2				1
							</									

page 1 of 1

Fig 2: Repertorization sheet

Repertorial Analysis - Ars. alb. - 19/9, Sil. - 18/9, Kali carb. - 17/8, Sulph. - 17/8, Puls. - 17/7, Rhus tox. - 16/9, Lyc. - 16/8, Nit. ac. - 16/7, Sep. - 16/7.

First Prescription

After analysing the repertorial result (Fig.-2) and referring

some of the Materia Medica books, Arsenicum album was the drug of choice. The selected medicine was prescribed in LM potencies i.e. 0/1, 0/2 in 30ml, 16 doses each, once daily morning for one month on 02-07-2021. Then the patient was advised to consult after one month.

Table 2: Time line of Treatment

Date	Symptoms	Investigation Reports	Medicine Prescribed
02.07.21	Fever came in 11 AM to 2 PM, preceded by shivering, followed by body pain. Burning of throat and nose, with sneezing. Fever ends after sweating. Thirst less. Chilly patient. Irritable, anxiety and nervous.	Blood - 30.06.2021- Hb-11.9 mg/dl, TRBC- 3.87mill/cumm, TWBC - 8300/cumm, D.C. in%- N-66, L-28, E -2,M-4, ESR- 32m/1 st hr,	Arsenic 0/1,0/2, 30ml, in 16 doses each, once daily in morning
12.08.21	Fever came at 11AM with body ache and chilliness, remained till end of night, > after foul smelling hot perspiration. Wants to cover always. Skin eruptions red maculo- papular type, with itching. On scratching raised red lines (dermatographia) marked. (Fig 3)	05.08.21- Blood – ICT for MP- Negative IgM (Scrub typhus)- 0.18(reactive >0.14), Positive. (Fig 4)	<i>Psor</i> 0/1, 0/2 30ml each in 16 doses, once daily in morning.
19.09.21	Fever intensity less, came on slight exertion with whole body pain, < in afternoon, wanted to cover always. Skin rashes diminished and changed to black spots, with less itching and less bleeding on cracked skin.		Psorinum 0/3 and 0/4, 30 ml each in 16doses,once daily in morning
17.10.21	No fever. Pain in body on slight movement and exposure to open air. Skin rashes and dermatographia diminished along with itching and bleeding.		Psorinum 0/5,0/6, 30 ml each in 16doses, once daily in morning
12.12.21	She had no fever or no skin rashes No dermatographia or itching of skin. Only weakness present with occasional myalgia and chilliness. One of the healing site of cracked skin is showed in Fig. 5)	07.11.21- Blood- Scrub Typhus Antibodies Rapid test- Not detected. (Fig. 6)	Psorinum 0/7- 0/8 given 30ml each in 16 doses, once daily in morning.



Fig 3: Rashes and scratching site with bleeding

Collected on	05/08/2021 12 44 25 PM	Received on	05/08/2021 04 28 54 PM
Reported on	06/08/2021 12 38 20 PM	PatSer No.	KIMSOPP7737193
Ref Doctor	Dr. Jayashree Nanda		
UHID			
TEST NAME		BIOLOGICAL REFERENCE INTERVALS	
ICT FOR MP : (Immunochromatography)		NEGATIVE	
Scrub Typhus IgM : (ELISA)		0.18	
Result(Num).		Reactive: >0.14 Non Reactive: <0.14	
Report Status: Final		* END OF REPORT *	

Fig 4: Scrub Typhus IgM Positive (6.6.21)



Fig 5: Healing site of cracked skin after treatment

DRAWN : 07/11/2021 08:37	RECEIVED : 07/11/2021 08:34	REPORTED : 09/11/2021
REFERRING DOCTOR : DR. JAYASHREE NANDA	CLIENT PATIENT ID :	
Test Report Status	Final	Results
Biological Reference Int		
Interpretation(s) RBC AND PLATELET INDICES- Mentzer index (MCV/RBC) is an automated cell-counter based calculated screen tool to differentiate cases of iron deficiency anaemia (>13) from B-12 deficiency in patients with microcytic anaemia. This needs to be interpreted in line with clinical correlation and suspicion. Estimation of HbA2 remains diagnosing a case of beta thalassemia trait. WBC DIFFERENTIAL COUNT - NLR-The optimal threshold of 3.3 for NLR showed a prognostic possibility of clinical symptoms to change from mild patients. When age = 45.5 years old and NLR = 3.3, 46.3% COVID-19 patients with mild disease might become severe. By contrast, when age = 3.3, COVID-19 patients tend to show mild disease. (Reference to - The diagnostic and predictive role of NLR, d-NLR and PLR in COVID-19 patients A-P. Yang, et al. International Immunopharmacology This ratio element is a calculated parameter and out of NABL scope. ERYTHRO SEDIMENTATION RATE. Blood-erythrocyte sedimentation rate (ESR) is a non-specific phenomena and is clinically useful in the diagnosis disorders associated with an increased production of acute phase reactants. The ESR is increased in pregnancy from about the 3rd month and remains high post partum. ESR is influenced by age, sex, menstrual cycle and drugs (eg. corticosteroids, contraceptives). It is especially low (0-1mm) in hypofibrinogenemia or congestive cardiac failure and when there are abnormalities of the red cells such as polycythemia, spherocytosis or sickle cell disease. Reference : 1. Nathan and Oski's Haematology of Infancy and Childhood, 5th edition 2. Paediatric reference intervals, AACC Press, 7th edition. Edited by S. Solati 3. The reference for the adult reference range is "Practical Haematology by Dacie and Lewis, 10th Edition"		
BIO CHEMISTRY		
C-REACTIVE PROTEIN, SERUM		
C-REACTIVE PROTEIN	9.1	High 0 - 3
METHOD : PARTICLE-ENHANCED TURBIDIMETRIC INHIBITION IMMUNOASSAY(PETTING)		
Interpretation(s) C-REACTIVE PROTEIN, SERUM: Immunoturbidimetry		
SEROLOGY		
SCRUB TYPHUS ANTIBODIES RAPID, SERUM		
SCRUBTYPHUS ANTIBODIES RAPID TEST	NOT DETECTED	NOT DETECTED

Fig 6: Scrub Typhus Antibody Test Negative (7.11.21)

Discussion

There are many basis of prescription like causation, prominent modalities, organo-specific, miasmatic and constitutional, etc [9]. In the present case the medicine was prescribed by taking into account of characteristic mental, physical, particular and pathological symptoms. After repertorisation, Arsenic was selected as similimum as it covered more number of symptoms and also in accordance with Materia Medica. But again, there was recurrence of all original symptoms which indicated Psorinum, according to

different Materia Medica books (Table 4). Psorinum in fifty millesimal potency in gradually increasing dose helped in removing the symptoms and also the disease [10-12]. Disappearance of scrub typhus antibody in the blood report is definitely a documentary evidence of cure. The Modified Naranjo Criteria score of the patient after treatment was 9, which indicates that there was a causal relationship between the result observed and the prescribed medicine. (Table-3) [13, 14].

Table 3: Modified Naranjo's Criteria scores of the patient after treatment

Sl. No.	Modified Naranjo's criteria	Patient's answer	Score
1	Was there an improvement in the main symptom or condition for which the homoeopathic medicine was prescribed?	Yes	+2
2	Did the clinical improvement occur within a plausible time frame relative to the medicine intake	Yes	+1
3	Was there an initial aggravation of symptoms?	No	0
4	Did effect encompass more than the main symptom or condition (i.e. were other symptoms ultimately improved or changes)?	Yes	+1
5	Did overall well-being improve?	Yes	+1
6	a. Direction of cure: did some symptoms improve in the opposite order of the development of symptoms of the disease?	Not sure Not sure	0
	b. Direction of cure: Did at least two of the following aspects apply to the order of improvement of symptoms:		

	From organs of more importance to those of less importance, From deeper to more superficial aspects of the individual, From the top downwards.		
7	Did “old symptoms” (defined as non-seasonal and non-cyclical symptoms that were previously thought to have resolved) reappear temporarily during the course of improvement?	No	0
8	Are there alternate causes (other than the medicine) that – with a high probability- could have caused the improvement? (Consider known course of disease, other forms of treatment, and other clinically relevant interventions)	No	+1
9	Was the health improvement confirmed by any objective evidence? (e.g. lab test, clinical observation, etc.)	Yes	+2
10	Did repeat dosing, if conducted, create similar clinical improvement?	Yes	+1
	Total		+9

There are limited success stories documented in the homeopathic literature on treatment of scrub typhus fever with nosodes like *Psorinum*. On the basis of the clinical experience of homeopathic physicians and Materia Medica knowledge from the books of different stalwarts (Table-4), the treatment of scrub typhus fever was successful.

Table 4: Symptoms of fever in *Psorinum* in different Materia Medica books

W. Boericke	J. T. Kent	S. R. Phatak
Extreme sensitiveness to cold. Wants covering even in summer. Profuse offensive perspiration in fever. Night sweats. Dreads of least cold air. Lack of reaction to indicated remedy. Attack of cold on change of weather, from cold to hot.	Intermittent febrile state. The patient is so hot, he is covered with a boiling sweat in fevers. The face is red puffed, mottled. Profuse night sweats with debility.	Easily takes cold, chilled, foul smelling discharges. In fever heat with steaming sweat. Sweat easy, profuse, < night, cold, on palms.

The first grade medicine for typhus fever in Boericke's Repertory are -
Fever, Typhus Fever - Ars., Bapt., Bell., Camph., Hyos., Lach., Op., Phos.ac., Phos., Rhus-tox ^[15].

Conclusion

It is evident from the above case report that individualised homeopathic medicine prescribed basing upon the totality of symptoms was effective in the treatment of Scrub typhus fever. It is a positive indication for Homoeopathic treatment to be evidence based that there is disappearance of the signs and symptoms within a short period of time along with a negative test of antibody for scrub typhus after treatment without any complications. However, from a single success case it is very difficult to draw any conclusion about the effectiveness in all the cases. So, more case series as well as clinical trials on effectiveness of homeopathic medicines in scrub typhus are required.

Acknowledgement

The author is grateful to Prof. (Dr.) Chaturbhuj Nayak, former Director General, Central Council for Research in Homoeopathy, New Delhi, Under Ministry of AYUSH, Govt. of India, for his untiring inspiration and help for writing evidence based scientific articles. The patient is also acknowledged for her co-operation and compliance during treatment and follow-ups.

Declaration of patient consent

The patient's consent for the publication of his case report has been obtained in a prescribed format. The patient has also given consent to share the images and all investigational reports for publication. The patient

understands and confirms that her identity will not be disclosed anywhere during publication.

Financial support and sponsorship: Nil

Conflicts of interest: None declared.

References

1. Park K. Text book of Preventive and Social Medicine. 26th ed. Madhya Pradesh: Banarsidas Bhanot publishers; c2021. p. 342.
2. Peter JV, Sudarsan TI, Prakash JA, Varghese GM. Severe scrub typhus infection: Clinical features, diagnostic challenges and management. World J Crit Care Med. 2015 Aug 4;4(3):244-50. Available <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4524821/>
3. Ralson SH, Penman ID, Strachan MWJ, Hobson RP. Davidson's Principles and practice of Medicine, 23rded. International Edition. Elsevier Ltd.; c2018.
4. Gurung S, Karki S, Pokharel S, Bhatta K. Scrub typhus in a primary health care center of Nepal: A case series. Ann Med Surg (Lond). 2022 Mar 8;75:103490. Available <https://pubmed.ncbi.nlm.nih.gov/35386785/>
5. Koh GC, Maude RJ, Paris DH, Newton PN, Blacksell SD. Diagnosis of scrub typhus. Am J Trop Med Hyg. 2010 Mar;82(3):368-70. Available <https://pubmed.ncbi.nlm.nih.gov/20207857/>
6. Svoboda E, Pathak N. Typhus, on September 28, 2020. (Internet). Available from <https://www.webmd.com/a-to-z-guides/what-is-typhus#091e9c5e81b4db79-2-5>
7. Chogle AR. Diagnosis and treatment of scrub typhus-- the Indian scenario. J Assoc Physicians India. 2010 Jan;58:11-2. Available from <https://pubmed.ncbi.nlm.nih.gov/20649092/>
8. Shah JJ. Homopath Classic- Homeopathic Software. Version 8.0 Premium. Mumbai: Mind technologies private limited; c2005.
9. Mathur KN, Wadia SR. Principles of prescribing, New Delhi: B. Jain Publishers Pvt. Ltd.; c1998.
10. Boericke W, Pocket Manual of Homoeopathic Materia Medica with repertory. 9th ed. New Delhi: B. Jain Publishers Pvt Ltd; c1985.
11. Kent JT. Lectures on Homoeopathic Materia Medica. Reprint Edition. New Delhi. B. Jain Publishers (P) Ltd.; c1987.
12. Phatak SR. Materia Medica of Homoeopathic Medicines. Reprint Edition. B. Jain Publishers Pvt. Ltd., New Delhi.; c1993.
13. Van Haselen RA. Homeopathic clinical case reports: Development of a supplement (HOM-CASE) to the CARE clinical case reporting guideline. Complement Ther Med. 2016 Apr; 25:78-85. Available <https://pubmed.ncbi.nlm.nih.gov/27062953/>

14. Rutten L. The importance of case histories for accepting and improving homeopathy. *Complementary Therapies in Medicine*. 2013;21:6:565-570. Available [tps://www.sciencedirect.com/science/article/pii/S0965229913001684](https://www.sciencedirect.com/science/article/pii/S0965229913001684)
15. Boericke OE. *Pocket Manual of Homoeopathic Materia Medica with additions of a Repertory*, 9th ed. Revised and Enlarged. New Delhi: B. Jain Publishers (P). Ltd.; c1984. p. 85.

How to Cite This Article

Nanda J, Choudhury S. Constitutional homoeopathic treatment of scrub typhus fever: A case report. *International Journal of Homoeopathic Sciences*. 2023;7(3):307-312.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.