IOP Publishing

Journal of Physics

Conference Series

The 11th Biennial Conference on Classical and Quantum Relativistic Dynamics of Particles and Fields

IOP Publishing

Table of contents

Volume 1665

2020

‹ Previous issue Next issue ›

The 2nd International Seminar on Smart Molecule of Natural Resources (ISSMART) 2020 25-26 August 2020, Malang, Indonesia

Accepted papers received: 01 October 2020
Published online: 20 October 2020

Open all abstracts

Preface

Papers

OPEN ACCESS

012032

Synthesis and potential of skipjack tuna bone hydroxyapatite as bone tissue engineering biomaterial

S C Wardani, H Sujuti, E Mustamsir and D N Hapsari

+ Open abstract View article PDF

OPEN ACCESS

012033

Evaluation of Total Phenolic, Total Flavonoid, and In Vitro Cytotoxic Activity of *Syzygium cumini* Extract in Cervical Cancer Cell

Hairil Fiqri, Adzani Gaisani Arda, Khodijah Adrebi, Wahyu Diah Proborini and Rahma Micho Widyanto

+ Open abstract View article PDF

OPEN ACCESS

012034

Cytoplasm and nuclear crude protein proportion observed in pheripheral blood mono nuclear cells under senescence inducing stress exposure

Titin Andri Wihastuti, Wiwit Nurwidyaningtyas, Fibe Yulinda Cesa and Cholid Tri Tjahjono

+ Open abstract View article PDF

OPEN ACCESS

012035

The Effects of ß-glucan Extract from Oyster Mushroom *(Pleurotus ostreatus)* on Expression of Serum Malondialdehyde in *Sprague dawley* Rats Induced by HFHF Diet

Ema Pristi Yunita, Astilia Mildha Yuniar, Inggita Kusumastuty, Alma Maghfirotun and Dian Handayani

+ Open abstract View article PDF

OPEN ACCESS

012036

The Status of VNN (*Viral Nervous Necrosis*)-Infected Grouper Fish Tissue with *Chlorella vulgaris* Extract as Anti-Virus Candidate

Uun Yanuhar, Diana Arfiati, Muhamad Musa, Kusriani, Nur Sakinah Junirahma and Nico Rahman Caesar

+ Open abstract View article PDF

OPEN ACCESS

012037

The Endogenous Development of *Eimeria tenella* in Chickens Injected Subcutaneously with Oocysts Protein as Initially Study of Development of Cecal Coccidiosis Killed Vaccine

Muchammad Yunus, Endang Suprihati and Agus Wijaya

+ Open abstract View article PDF

JOURNAL LINKS

Journal home

Information for organizers

Information for authors

Contact us

I Cholissodin, S Sutrisno, N Santoso, A A Soebroto, N Hidayat and N T Rochman

+ Open abstract View article PDF

OPEN ACCESS 012004

In vitro and In silico Analysis of Pomegranate (*Punica granatum* L.) Fruit Powder as Pancreatic Lipase and α-Amylase Inhibitor

Andi Alfira Ratna F Dewi, Muntholib and Subandi

+ Open abstract View article PDF

OPEN ACCESS 012005

The cyanidin-3-O-glucoside of Black Rice inhibits the interaction of HMG-CoA and HMG-CoA Reductase: three-and two-dimension structure

Fatchiyah Fatchiyah, Hazna Noor Meidinna and Eko Suyanto

+ Open abstract View article PDF

OPEN ACCESS 012006

Molecular Identification and Phylogenic Analysis of Phosphate Solubilizing Bacteria *Aneurinibacillus migulanus* From Rhizosphere *Imperata Cylindrica*, Karst Citatah, Bandung Barat, Jawa Barat, Indonesia

A R Hafsari and L Purnawan

+ Open abstract View article PDF

OPEN ACCESS 012007

Effects of Dietary Brown Rice on Carcass Composition and Nitric Oxide (NOx) Metabolite Levels in High-Fat High-Fructose Diet-induced Sprague Dawley Rats as Obesity Model

Dian Handayani, Ahmad Ramadhan, Risma Debby Anindyanti, Alma Maghfirotun Innayah, Etik Sulistyowati and Inggita Kusumastuty

+ Open abstract View article PDF

OPEN ACCESS 012008

Immune Response of VNN (*Viral Nervous Necrosis*) Infected Grouper Utilizing *Chlorella vulgaris* Extract as an Anti-Virus Candidate

Nur Sakinah Junirahma and Uun Yanuhar

+ Open abstract View article PDF

OPEN ACCESS 012009

Propolis Extraction Using Vacuum Resistive Heating Method

Annisa Aurora Kartika and Anang Lastriyanto

+ Open abstract View article PDF

OPEN ACCESS 012010

Factor Analysis of Lipid Profile in Early Adulthood with Inappropriate Food Consumption Habit: Screening Approach Dyslipidemia Induce Atherogenesis Acceleration

Journal of Physics: Conference Series

The Endogenous Development of *Eimeria tenella* in Chickens Injected Subcutaneously with Oocysts Protein as Initially Study of Development of Cecal Coccidiosis Killed Vaccine

1665 (2020) 012037 doi:10.1088/1742-6596/1665/1/012037
IOP Publishing

The Endogenous Development of *Eimeria tenella* in Chickens Injected Subcutaneously with Oocysts Protein as Initially Study of Development of Cecal Coccidiosis Killed Vaccine

Muchammad Yunus[1*], Endang Suprihati[2], and Agus Wijaya[3]

[1,2]Department of Veterinary Parasitology, Faculty of Veterinary Medicine, Airlangga University
[3]Veterinary Internal Medicine Division, Department of Clinic, Reproduction and Pathology, Faculty of Veterinary Medicine, IPB University

*Corresponding author email: muchammad-y@fkh.unair.ac.id

Abstract. The study was carried out to observe the endogenous development of *E. tenella* histomorphologically in chickens subcutaneously injected with *E. tenella* oocyst protein. One day old of twenty-four broiler chickens were divided into 2 groups, each group containing twelve chicks. Group 1 was as control group injected subcutaneously on the neck with two doses: the first dose was administered at age 4th day with Freund's Complete Adjuvant (FCA) emulsified in PBS and administered booster dose was injected at 18th day of age with Freund's Incomplete Adjuvant (FICA) emulsified in PBS. Group 2 was injected subcutaneously on the neck with two doses: first dose at 4th day of age with 50 μg *E. tenella* oocyst protein emulsified in FCA and booster dose was given at 18th day of age with 50 μg oocyst protein emulsified in FICA. After 14 days of booster, the both groups were challenged orally 1 x 10^4 of virulent *E. tenella*. The assessment of endogenous development of *E. tenella* in chickens evaluated histomorphologically of cecum and oocyst production examination. Injected *E. tenella* oocyst protein chickens were challenged at 32nd day of age, demonstrated that parasite endogenous development in intestine histomorphologically appeared decreased in proliferation and suppressing oocyst production rate around 68% compared with un-injected chicken. Impaired development of endogenous parasites occurs due to protective immunity resulting from exposure to antigens so that the ability to reproduce and multiply the parasites decreases. The study results demonstrated that relatively sufficient protection against coccidia by use the *E. tenella* oocyst protein as material of cecal coccidiosis killed vaccine in broiler after challenge. *E. tenella* oocysts protein can generate protective immunity against homologous challenge through reduction of proliferation parasite and the presence of parasites disabilities.
Keywords: oocyst protein, *E. tenella*, endogenous development

1. Introduction

Coccidiosis is a parasite infection that primarily affects the intestinal tract. It is caused by a member of the genus *Eimeria* of the phylum Apicomplexa and is characterized by a complex life cycle. This

parasitic infection affects many species of mammals and birds, and is of great economic importance to livestock, especially poultry. Several species of *Eimeria* to be the cause of coccidiosis in poultry. Coccidiosis is very immunogenic, initial infection can induce strong immunity to homologous challenges [1]. The control approach through vaccination is considering more importantly, a live vaccine containing a virulent or attenuated *Eimeria* strain is available but its limited use in the poultry industry because of their high cost. Additionally, the vaccine consists of several *Eimeria* species, making it labor and cost intensive of production. Also, this type of vaccine can revert to pathogenic forms [2]. Therefore, research efforts have been invested in the development of an anticoccidial protein vaccine consisting of antigens as an alternative to live vaccines. One of protein exploration can be done to oocysts to induce protective immunity. The present study used the oocyst extract as a material of killed vaccine to protect chickens from *Eimeria* parasite. The study was carried out to inspect the endogenous development of *E. tenella* histomorphologically in chickens subcutaneously injected with *E. tenella* oocyst protein.

2. Materials and Methods

This study used twenty-four one-day-old broiler chickens as experimental animals. They were divided into 2 groups, each group containing twelve chicks. Group 1 was as control group injected subcutaneously on the neck with two doses: the first dose was administered at 4th day of age with Freund's Complete Adjuvant (FCA) emulsified in PBS and booster dose was injected at 18th day with Freund's Incomplete Adjuvant (FICA) emulsified in PBS. Group 2 was injected subcutaneously on the neck with two doses: the first administered dose at age 4th day with 50 μg antigen (*E. tenella* oocyst protein) emulsified in FCA and booster dose was injected at 18th day of age with 50 μg antigen emulsified in FICA. After two weeks of last immunization the both groups were challenged orally 1 x 104 of virulent *E. tenella*. Efficacy of protection of the use of *E. tenella* oocyst protein against homologous challenges in chickens appraised through the daily and total of oocyst production and endogenous development of *E. tenella* histomorphologically in cecum observation.

3. Results and Discussion

Injected subcutaneously birds with oocyst protein were challenged at 32nd day of age, demonstrated that oocyst protein could provide chickens with protection rate around 68%, the daily oocyst production from initial to the end passed through the faeces and also total oocysts production of *E. tenella* oocyst protein injected chickens group decrease significantly than the *E. tenella* oocyst protein uninjected chickens group (Figs. 1 and 2).

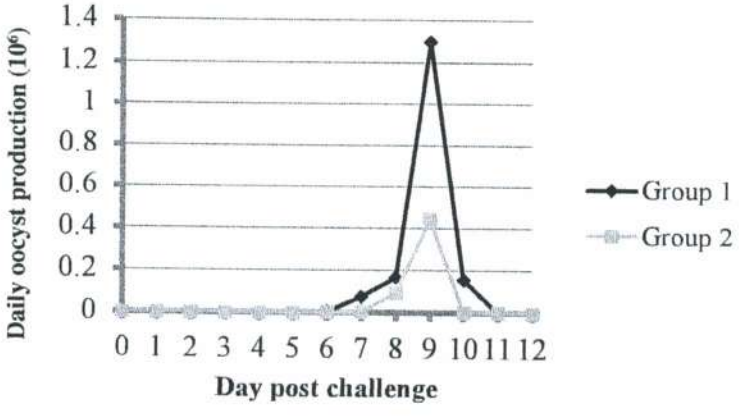


Figure 1. The comparison of pattern of daily oocyst production between *E. tenella* oocyst protein uninjected chickens group (Group 1) and *E. tenella* oocyst protein injected chickens group (Group 2). The degradation of oocyst production appeared in oocyst protein injected chickens group compared

oocyst protein uninjected chickens group exhibit potential ability oocyst protein in stimulation of protective immunity on hospes.

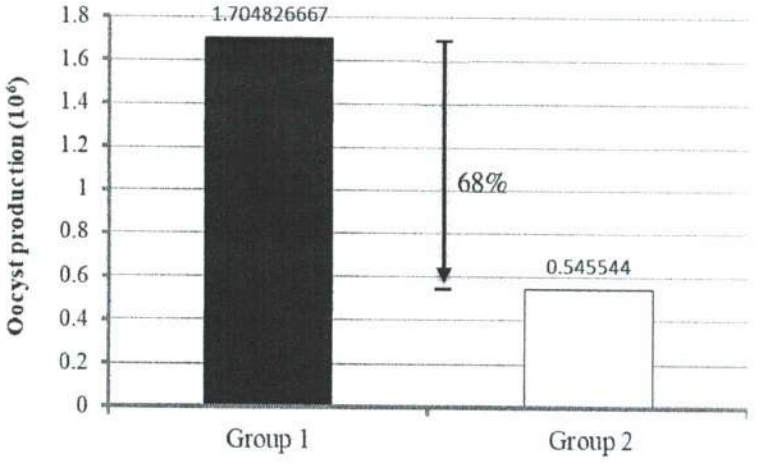


Figure 2. The comparison of oocyst production between *E. tenella* oocyst protein uninjected chickens group (Group 1) and *E. tenella* oocyst protein injected chickens group (Group 2), 68% oocyst production was suppressed in *E. tenella* oocyst protein injected chickens group.

The decrease of oocyst production in *E. tenella* oocyst protein injected chickens group emphasized by an overview of the development of parasite in predilection site as cecum histomorphologically. The few development and proliferation of parasites was seen histomorphologically in cecum (Fig. 3).

The immune response to vaccines exhibits humoral and cellular protection. The previous study suggested that specific IgG antibody responses to *E. tenella* were generated in chickens immunized with recombinant rhomboid-like proteins expressed in *E. coli* and this protein was able to elicit humoral responses and activate cell-mediated immunity in birds [3]. The study by Akhtar et al. [4] demonstrated humoral response and challenge when using supernatant of sonicated oocysts inducing strong protection because immune chicks contain high levels of antibodies to resist severe dose challenges. Sporozoite that used as protein vaccine gives 66.7% percent protection [5], while in another studies by Subramanian *et al.* [6] and Geriletu *et al.* [7] gives 60% and 77.3%, respectively percent protection when use recombinant *E. tenella* sporozoite antigen. Finally, it was found that in order to obtain the ultimate protective immunity using parasite extracts required the correct inclusion of antigens and exclusion of irrelevant antigens [8].

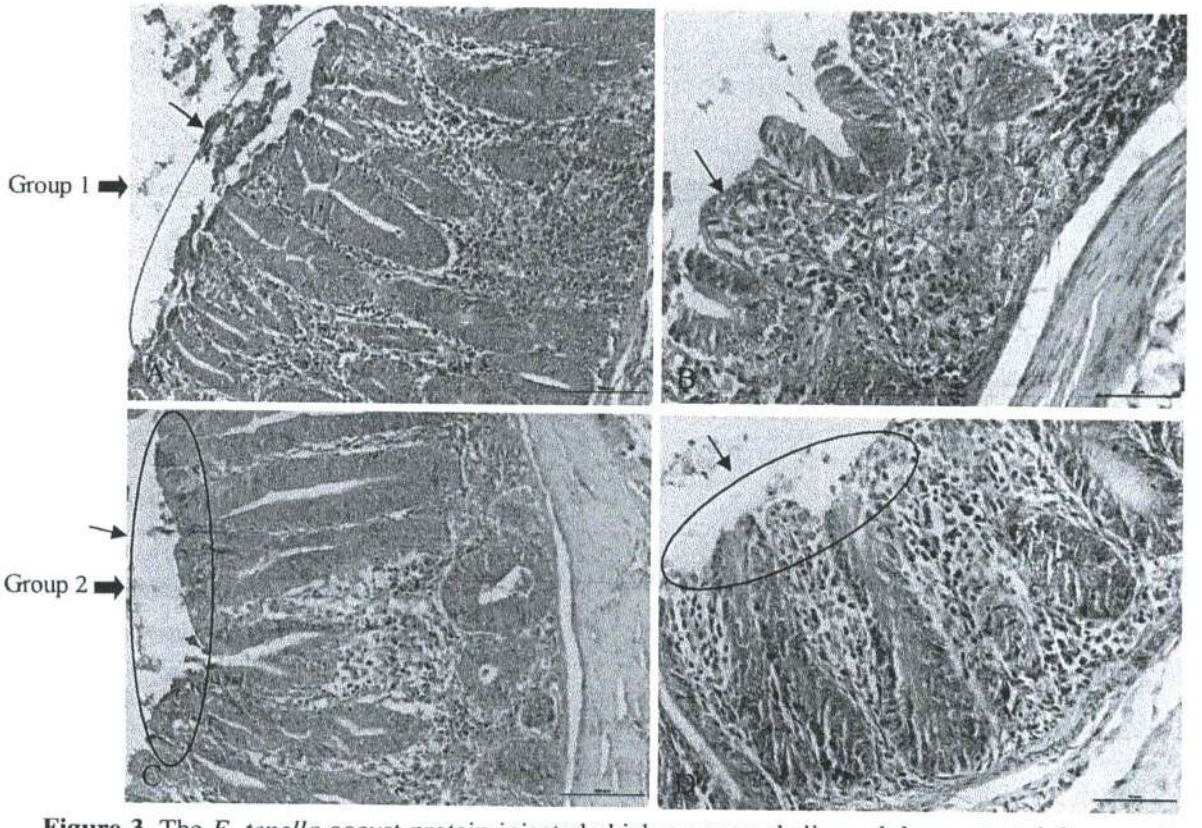


Figure 3. The *E. tenella* oocyst protein injected chickens were challenged demonstrated that parasite endogenous development in cecum appeared decreased in proliferation and suppressing to be continue development completely compared with *E. tenella* oocyst protein uninjected chickens. The development of protective immunity in *E. tenella* oocyst protein injected chickens group suppressed capacity of multiplication of parasite. A, appeared erosion of cecum mucosa; B, parasites well development; C, reduced damage of cecum mucosa; D, few parasites development. A and C (200x magnification); B and D (400x magnification). Arrow, the changes that have occurred.

4. Conclusions

The study results demonstrated that relatively sufficient protection against coccidia by use the *E. tenella* oocyst protein as material of cecal coccidiosis killed vaccine in broiler after challenge. *E. tenella* oocysts protein can generate protective immunity against homologous challenge through reduction of proliferation parasite and the presence of parasites disabilities. The further study for investigating efficacy of *E. tenella* oocysts protein in induction of protective immunity against heterologous challenge.

Acknowledgement

This study was funded by Directorate of Higher Education, Ministry of Education and Culture of the Republic of Indonesia, Airlangga University for funding through Higher Education Excellence Research Grant for a research contract number: 754/UN3.14/PT/2020.

References

[1] Allen P C and Fetterer R H 2002 Recent advance in biology and immunology of *Eimeria* species and in diagnosis and control of infection with these coccidian parasites of poultry. *Clin. Micro. Rev.* 1015: 58-65.
[2] Sharman P A, Smith N C, Wallach M G and Katrib M 2010 Chasing the golden egg: Vaccination against poultry coccidiosis. *Parasite Immunol.* 32: 590-598.
[3] Li J, Zheng J, Gong P and Zhang X 2012 Efficacy of *Eimeria tenella* rhomboid-like protein as a subunit vaccine in protective immunity against homologous challenge. *Parasitol. Res.*110: 1139-1145.
[4] Akhtar M, Hayat C S, Hayaz S, Ashfaque M, Ayaz M M and Hussain I 2001 Development of immunity to coccidiosis in chicken administrated sonicate Coccidial Vaccine. *Pakistan Vet. J.* 21(2): 61-64.
[5] Badawy G A and Aggour M G 2006 Immune responses in chickens against *Eimeria tenella* antigen. *Assiut. Vet. Med. J.* 52: 178-186.
[6] Subramanian B M, Sriraman R, Rao N H, Raghul J, Thiagarajan D and Srinivasan V A 2008 Cloning expression and evaluation of the efficacy of arecombinant *Eimeria tenella* sporozoite antigen inbird. *J. Vaccine* 26: 3489-3496.
[7] Geriletu L, Xu, Xurihua and Li X 2011 Vaccination ofchickens with DNA vaccine expressing *Eimeria tenella* MZ5-7 against coccidiosis. *Vet. Parasitol.* 177: 6-12.
[8] Wallach M, Smith N C, Miller C M D and Ekart J 1994 *Eimeria maxima*: ELISA and western blot analysis of protective sera. *Parasite Immunol.* 16: 377-378.

Journal of Physics: Conference Series

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
United Kingdom Universities and research institutions in United Kingdom	Physics and Astronomy Physics and Astronomy (miscellaneous)	IOP Publishing Ltd.	70

PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Conferences and	17426588, 17426596	2005-2020	Homepage

How to publish in this journal

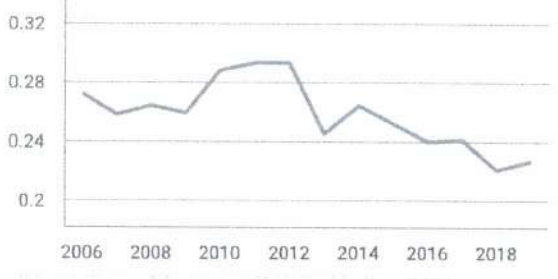
jpcs@ioppublishing.org

SCOPE

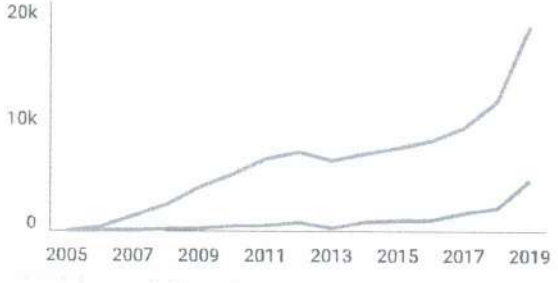
The open access Journal of Physics: Conference Series (JPCS) provides a fast, versatile and cost-effective proceedings publication service.

Join the conversation about this journal

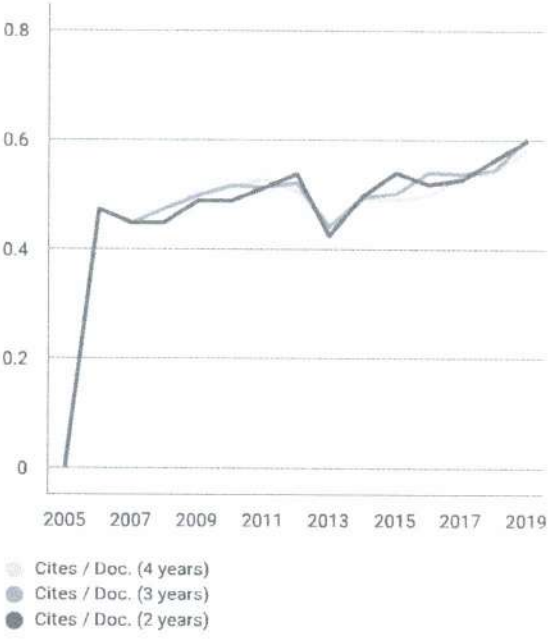
SJR



Total Cites Self-Cites

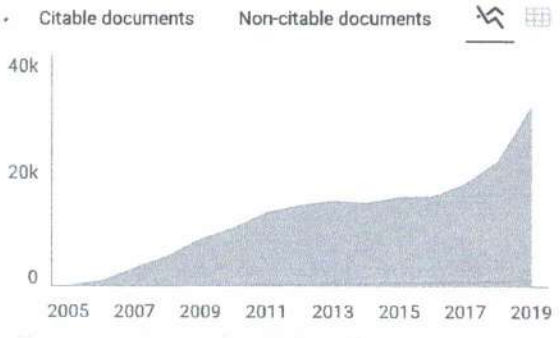


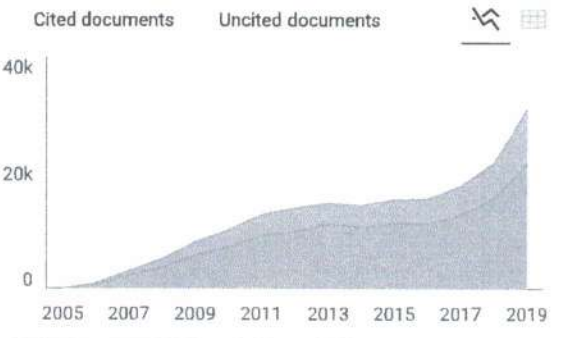
Citations per document



External Cites per Doc Cites per Doc

% International Collaboration





Journal of Physics: Conference Series

Not yet assigned quartile

SJR 2019
0.23

powered by scimagojr.com

← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scimag
```

Metrics based on Scopus® data as of April 2020

Sheetal Jagdale 4 months ago

This "Journal of Physics: Conference Series" is classified as Journal in SCOPUS october 2020 list.
Even in https://www.scopus.com/sources it is listed in Journal
But the SCImago has mentioned conference.
Kindly guide

reply

Samar Ghazal 2 months ago

Dear,
SCImago Team
I already saw all comments below, the fact is that the Journal of Physics: Conference Series is still classified as a journal in Scopus (30/1/2021). Can you check it with Scopus, please?
Thank you so much
Regards,
Samar

SCImago Team

Melanie Ortiz 2 months ago

Dear Samar,
Thank you for contacting us.
As said below, Scopus sent us a request to change the publication type from "Journal" to "Conference and Proceedings" last August.
For further information, you need to contact Scopus Support Team here: