

年間約83万人以上が、マラリアを罹患する[数が過半数]によって命を落としています。今も世界で2人に一人、32億人がマラリアの脅威にさらされ、新たな患者数は年間2億人を超えており、世界三大感染症(マラリア、結核、エイズ)の中でも突出しています。

日本のチカラを  
世界のゼロマラリアへ

# malaria NO MORE japan



## 国際会議「サブサハラアフリカにおける稲作振興とマラリア対策」の報告

# 蚊を減らしコメを増やす。求められる新たな対策

7月19日、国際会議「サブサハラアフリカにおける稲作振興とマラリア対策」(マラリア・ノーモア・ジャパン主催)が、参議院議員会館で開かれました。アフリカのサブサハラ(サハラ砂漠以南)地域で広がる稲作が、マラリアの感染リスクを高めているという最新の文献調査の結果を受け、専門家や支援機関の関係者が議論、今後の対策についての提案や関係機関への働きかけを確認しました。その概要をご報告します。

## サブサハラ地域での稲作と新たな課題

サブサハラ地域では、人口増や都市化などを背景にコメの消費量が急増していますが、生産量が追いついていません。食糧価格が世界的に高騰していた2008年の「第4回アフリカ開発会議」では、「今後10年間でコメ生産量倍増」の目標が盛り込まれました。これを受け、独立行政法人国際協力機構(JICA)などが設立した「アフリカ稲作振興のための共同体」による支援が本格化、同地域のコメ生産量は2018年までの10年間で倍増しました。ただ消費の伸びも速く、同地域のコメ自給率は48%(2020年時点)にとどまっており、今後もコメ増産とその支援は続く見通しです。一方、新たな課題も浮上しています。稲作地

域でのマラリア感染リスクが非稲作地域よりも高いことが最近の研究で明らかになり、感染を媒介する蚊の発生源である水田での対策が急務となっています。ただ現場では、水田がマラリア感染のリスク要因になっているという情報が十分に浸透していません。そこでこの日の会議で最新の調査結果や、稲作地域でのマラリア感染予防の具体策を共有することにしました。超党派の国会議員でつくる「2030年までにマラリアをなくすための議員連盟」の松本剛明会長(自由民主党衆議院議員)は、会議冒頭のあいさつで、従来の稲作振興支援について「現地の暮ら



「2030年までにマラリアをなくすための議員連盟」の松本剛明会長(自由民主党衆議院議員)

や(日本の)国際的なポジションを引き上げる役割を果たしてきた」と評価。その上で「リスクの度合いをしっかりと見極めるためにも、研究成果を拝聴し対応したい」と述べました。

## 最新の知見が示す「水田のパラドックス」からの転換

英ロンドン大学衛生・熱帯医学大学院のジョー・ライン教授とカリスタ・チャン研究助手が、サブサハラ地域での稲作とマラリアの関係について解説しました。

感染予防策の普及に伴い、アフリカでの年間マラリア死者数は20年前と比べて約50%減りましたが、サブサハラ地域の死者数は世界全体の9割を占め、依然深刻な状況が続いています。その理由として、①現地が多いマラリア原虫の高い致死性②脆弱な医療制度③人からの吸血を特に好むマラリア媒介蚊(ガンビエハマダラカ)の特性などがあがっています。

ガンビエハマダラカは、水が張られて間もない水田のような、新鮮な淡水がたまった場所で繁殖するので、水田面積の増加は媒介蚊の増加、ひいては感染者数増加につながると考えられていました。しかしながら、2000年初頭の研究で、稲作地域の方が媒介蚊の数が多いにも関わらず、感染者数は非稲作地域とほぼ同じか、もしくは少ないことが分かりました。

当初の予想に反する結果から、この結果は「水田の逆説」(Paddies Paradox)と呼ばれ、稲作による農家の所得向上や、過去の感染による免疫の獲得などが、稲作地域のマラリア感染を抑制している可能性を示唆する仮説として、この20年ほど支持されてきました。



写真左より出席された神余隆博 Malaria No More Japan 理事長、[2030年までにマラリアをなくすための議員連盟]の松本会長、古川元久幹事長(国民民主党衆議院議員)



ところが、マラリアの予防対策が本格化した2003年以降は、稲作地域の感染件数の方が非稲作地域より多いことが最近の研究で明らかになりました。従来「逆説」を覆す結果の理由として、ライン教授は「この20年で医療体制が整い、蚊帳や殺虫剤も普及し、稲作地域とほかの地域との貧富の差もなくなり、平等になった」と指摘、予防策の普及で地域間格差が解消されたことで、稲作とマラリアの関係が顕在化したとする見方を示しました。

最新の知見を踏まえ、チャン研究助手は水田でのマラリア媒介蚊の繁殖を抑える具体策として、殺虫剤の散布や、媒介蚊の幼虫を食べる魚の水田養殖、田んぼへの灌漑と排水を繰り返す「間断灌漑」などを紹介。経済性や持続性、環境への影響などを勘案しながら「短期的な介入と長期的な介入を組み合わせる必要がある」と述べました。

「2030年までにマラリアをなくすための議員連盟」の熊野正士事務局長(公明党参議院議員)



「2030年までにマラリアをなくすための議員連盟」の熊野正士事務局長(公明党参議院議員)

## 「医療や教育もパッケージにした農村開発を」。専門家が意見

最新の知見報告を受け、2人の研究者からコメントがありました。

大阪公立大学大学院医学研究科の金子明特任教授は「アフリカにおける水田稲作とマラリア伝播の関係性を明確に示している」と、ライン教授らの報告を評価。乳幼児のマラリアの発症と稲作との関係や、無症状感染と稲作との関係についても「検討の必要がある」と述べました。また、水田での媒介蚊発生を抑制する方法として、農民向け啓発プログラムや、農民主導のボウフラ・モニタリングを提案しました。また、「海外援助による農業形態はアフリカの生物多様性を失わせる方向に働き、貧困からの脱却にも寄与してこなかった」と指摘されているとして、コメ等の単一作物による農業開発支援への再考にも言及しました。

長崎大学熱帯医学研究所の皆川昇教授は、金子特任教授の指摘を「非常に重く受け止める必要がある」と述べたうえで「対策をとるにしても、一つのアプローチだけではなく、いろいろなアプローチが必要。マラリア対策も幼虫や成虫の対策、蚊帳の普及、無症候性の感染対策と、いろいろな面から考える必要がある。農村開発も、農業だけでなく医療や教育もパッケージにした対策を考えなくてはならない。その意味で今日の報告は『多様性』がキーワードになると思う」と述べました。

続いて、同地域の稲作振興を支援してきたJICAの井本佐智子理事が、現状と今後の取り組みについて展望を述べました。従来の稲作振興の支援でとられてきたマラリア対策は「限定的だった」と評価。今後は「現場レベルで、農業・保健の双方から農民を交えて認識を共有するところから始めるべき」と話しました。

一方で、稲作が農民の収入向上をもたらす、網窓、蚊帳、殺虫剤などへのアクセスを促進したとも指摘。「ベネフィットとリスクをしっかりと考えて今後の取り組みを強化したい」として、JICA支援先の政府マラリア対策関係者や、現

地のコメ農家との情報共有や認知向上を働きかけ、地域の实情に合った対策につなげる考えを示しました。

議論の後、マラリア・ノーモア・ジャパンの神余理事長は、稲作振興とマラリア対策の両面からの対策を求める「要望書」を、同議連のメンバーに提出。松本会長のほか、阿部知子副会長(立憲民主党衆議院議員)、古川元久幹事長(国民民主党衆議院議員)、熊野正士事務局長(公明党参議院議員)が受け取りました。



要望書の内容は次の通りです。

- 1 JICAによる稲作振興事業において、気候変動による影響も含め、生態系や環境変化が引き起こすマラリア流行リスクを調査・モニタリング・評価し、必要な対策を組み合わせること。
- 2 水田稲作推進拡大により、新たにマラリアの突発的流行が予測される地域に対し、PPR(予防、備え、対応)を強化し、ヘルスセキュリティを確保すること。早期の事前警報システム整備や感染対策(診断、治療、ベクターコントロール)を行うこと。
- 3 蚊の発生抑制のための稲栽培技術の開発に取り組むため、農業振興とヘルスセクターの共同研究に関する包括的なプログラムを確立すること。

注:記事での「稲作」は、主に水稲栽培を指しています。



長崎大学熱帯医学研究所 皆川昇教授

## INTERNATIONAL CONFERENCE "RICE CULTIVATION AND MALARIA CONTROL IN SUB-SAHARAN AFRICA"

### 国際会議 「サブサハラアフリカにおける 稲作振興とマラリア対策」

- 開催日: 2022年7月19日(火) 16:00~17:00
- 会場: 参議院議員会館 特別会議室
- 主催: 認定NPO法人 Malaria No More Japan
- 共催: 2030年までにマラリアをなくすための議員連盟、RBM Partnership to End Malaria
- 言語: 日本語・英語(同時通訳有)
- 参加費: 無料

### EVENT SCHEDULE

#### 【イベントスケジュール】

#### ▼ 16:00 開会

司会: 石毛 郁治  
(Malaria No More Japan 専務理事)

#### ▼ 2030年までにマラリアをなくすための議員連盟より挨拶

- ・松本剛明 衆議院議員  
(2030年までにマラリアをなくすための議員連盟会長、自由民主党国際協力調査会会長)

#### ▼ 調査結果報告 「サブサハラアフリカにおけるコメとマラリアの関連性(仮)」

- ・ジョー・ライン  
(ロンドン大学衛生熱帯医学大学院(LSHTM)教授)
- ・カリスタ・チャン  
(LSHTM)
- ・齋藤和樹  
(Africa Rice Center)



#### ▼ 専門家よりコメント

- ・皆川昇  
(長崎大学熱帯医学研究所教授)
- ・金子明  
(大阪公立大学大学院医学研究科特任教授)

#### ▼ 独立行政法人国際協力機構よりコメント

- ・井本佐智子  
(独立行政法人国際協力機構理事)

#### ▼ 日本のゼロマラリアに向けた統合型戦略の提言とマラリア議連への手交

- ・神余隆博  
(Malaria No More Japan 理事長、関西学院理事・関西学院大学教授・同大学国連外交統括センター長)

#### ▼ 17:00 終了



Let's End Malaria  
in Our Lifetime

# malaria NO MORE japan

## MALARIA

Every year more than 830,000 people die from mosquito-borne diseases. One in two people are in the risk of malaria in the world, and every year more than 200,000,000 people are suffering from malaria.



### Report on the International Conference "Rice Cultivation and Malaria Control in sub-Saharan Africa"

## Less Mosquitoes, More Rice. New Measures Needed

On July 19, an international conference, the International Conference "Rice Cultivation and Malaria Control in sub-Saharan Africa," organized by Malaria No More Japan, was held at the House of Councilors building. In response to the results of the latest literature review showing that rice cultivation, which is spreading in sub-Saharan Africa, is increasing the risk of malaria infection, experts and officials from support organizations discussed the results, made proposals for future measures, and confirmed their approach to the relevant organizations. A summary of the meeting is reported below.

### Rice Cultivation and Emerging Issues in Sub-Saharan Africa

In the sub-Saharan region, rice consumption is rapidly increasing due to population growth and urbanization, but rice production is not keeping pace. At the Fourth African Development Conference in 2008, when food prices were soaring worldwide, the goal of doubling rice production in the next 10 years was included. In response, the "Coalition for African Rice Development: CARD Community for the Promotion of Rice Cultivation in Africa" established by several organizations including the Japan International Cooperation Agency (JICA) and another organizations began providing full-scale support, and rice production in the region doubled in the 10 years to 2018. However, in fact, rice consumption is has been also growing rapidly, and but the region's rice self-sufficiency rate remains at 48% (as of 2020), so increased increasing of the rice production and its support is

would be expected to continue in the future. On the other hand, new challenges are emerging. Recent studies have shown that the risk of malaria infection is higher in rice-growing areas than in non-rice-growing areas, and that there is an urgent need to introduce measures to rice paddies which are the main breeding sources of the vector mosquitoes. However, information that paddy fields are a risk factor for malaria transmission has not been fully disseminated in the endemic field. Therefore, the latest results of the survey results and specific measures to prevent malaria infection in rice-growing areas were shared at this day's meeting conference. In his opening remarks at the meeting, Hon. Takeaki Matsumoto, Member of House of Representatives, and Chair of the Parliamentary Group to End Malaria by 2030 in Japan, which is a non-



Hon. Takeaki Matsumoto, Member of House of Representatives, and Chair of the Parliamentary Group to End Malaria by 2030 in Japan

partisan group of Diet members, commended the existing support for the promotion of rice cultivation, saying that "It has played an important role in improving the lives of local people and Japan's international position". He then stated, "We would like to listen attentively to the results of the study and respond to them in order to carefully assess the degree of its risk.

### Latest Findings Show a Shift from the "Paddy Paradox"

With the spread of infection control measures, the annual number of malaria deaths in African region has decreased by about 50% compared to that of 20 years ago, but the situation remains serious in the sub-Saharan region, accounting for 90% of all deaths from malaria worldwide. The reasons for this include: (1) high lethality by *Plasmodium falciparum* which is most widely distributed in the region; (2) fragile health systems; and (3) the characteristics of the biting behavior of vector mosquito (*Anopheles gambiae*) which prefers sucking blood from humans. Since *An. gambiae* prefers to breed in newly-flooded freshwater pools such as in rice paddy fields that have just flooded with fresh water, so it was thought that an increase in the area of paddy fields would lead to an increase in the number of vector mosquitoes and, consequently, an increase in the number of malaria infected people. However, a study in early 2000 found that despite higher numbers of vector mosquitoes in rice-growing areas, the number of infections was about the same or lower than in non-rice-growing areas. This result, which was contrary to the initial expectations, has been called the "Paddy Paradox" supported for the past 20 years as a hypothesis, suggesting that the increased income of farmers due to rice cultivation and the immuni-



Photo from left: Dr. Takahiro Shinyo, Chairman of Malaria No More Japan, Hon. Takeaki Matsumoto, Secretary General Motoshi Furukawa (a member of the House of Representatives, the Democratic Party for the People)

### "Rural development that includes healthcare and education as part of the package". Experts exchange their opinions

Dr. Akira Kaneko, a specially-appointed professor at Osaka Metropolitan University, Graduate School of Medicine, praised the report by Professor Lines and his colleagues, saying that "This clearly shows the relationship between paddy rice cultivation and malaria transmission in Africa". "The relationship between rice cultivation and malaria in infants, as well as the relationship between asymptomatic infection and rice cultivation, are needed to be examined", he said. He also suggested awareness-raising programs for farmers and farmer-led monitoring of mosquito larvae in rice paddy fields as a way to reduce the incidence of mosquitoes. He finally touched on a reconsideration of agricultural development support measures based on a single crop such as rice, saying that "It has been pointed out that foreign aid for agriculture has contributed to the loss of Africa's biodiversity and has not helped those people from poverty".



Ms. Sachiko Imoto, Senior Vice President of JICA

Prof. Noboru Minagawa, Institute of Tropical Medicine (NEKKEN), Nagasaki University, stated that Dr. Kaneko's point needs to be taken very seriously. "Malaria control also needs to be considered from various aspects, including measures against larvae and adults, the spread of mosquito bed nets, and some control strategy against asymptomatic infection. In rural development, the measures for not only agriculture but also healthcare and education in packages must also be considered. In this sense, I think the keyword in today's report is 'diversity', he mentioned.

Then, Ms. Sachiko Imoto, Senior Vice President of JICA, who has been supporting the promotion of rice cultivation in the region, expressed the current situation and future prospects of the promotion. She noted that the malaria control measures taken in the past while supporting the promotion of rice cultivation were "limited". She stated that "we should start sharing awareness at the field level with farmers from both the agricultural and health point of views.

On the other hand, she also noted that rice cultivation has improved farmers' incomes and facilitated access to net windows, mosquito bed nets, and insecticides. She expressed her desire to strengthen future efforts by carefully considering the benefits and risks, and to share information and raise awareness with government officials involved



Secretary General Masashi Kumano (a member of the House of Councilors, the New Komeito Party)

ty acquired through past infection may have suppressed malaria infection in rice-growing areas. However, a recent study has revealed that since 2003, when malaria prevention measures began in earnest, the number of infection in rice-growing areas has been higher than that in non-rice-growing areas. As a reason for the result that overturns the conventional "paradox," Professor Lines pointed out that "over the past 20 years, health system has improved, mosquito bed nets and insecticides have been used widely, and the rich-poor gap in rice-growing areas and other areas has disappeared, making the people more equal", explaining that the wider spreading of preventive measures has eliminated disparities between regions, which eventually disclosed the apparent relationship between rice cultivation and malaria. Based on the latest findings, Research Assistant Chang introduced such concrete measures to control the breeding of malaria vector mosquitoes in rice paddy fields as application of larvicides, paddy farming of fish that eats the larvae of vector mosquitoes, and "intermittent irrigation" by which rice paddies are irrigated and drained repeatedly. She stated that "a combination of short-term and long-term interventions are needed", taking into consideration economic efficiency, sustainability, and environmental impact.

in malaria control supported by JICA and local rice farmers in order to implement measures that match the actual conditions in the region. After the discussion, Prof. Shinyo, Chairman of the Board of Malaria No More Japan, submitted a "policy recommendation" to the members of the Parliamentary Group to End Malaria by 2030 in Japan, calling for attention to both sides of the issues on promotion of rice cultivation and malaria control. Chair of the Parliamentary Group, Mr. Takeaki Matsumoto, together with Vice Chair Tomoko Abe (a member of the House of Representatives, the Constitutional Democratic Party of Japan), Secretary General Motoshi Furukawa (a member of the House of Representatives, the Democratic Party for the People), and Secretary General Masashi Kumano (a member of the House of Councilors, the New Komeito Party) received the letter.



The content of the written request is as follows  
1. JICA should survey, monitor and evaluate (SME) the risk of malaria epidemics caused by ecosystem and environmental changes including the effects of climate change, and incorporate necessary countermeasures through the CARD (Coalition for African Rice Development) initiative in Sub-Saharan Africa.



Prof. Noboru Minagawa, Institute of Tropical Medicine (NEKKEN), Nagasaki University

2. Strengthen PPR (prevention, preparedness, and response) and ensure health security in the areas where malaria epidemics are newly expected due to the expansion of irrigated rice cultivation. This includes the development of an early warning system and infection control measures (diagnosis, treatment, and vector control).  
3. Establish a comprehensive programme of joint research between agriculture and health sectors to develop methods of growing rice capable of reducing emergence of mosquitoes.

Note: "Rice cultivation" in the article refers primarily to paddy rice cultivation.

### INTERNATIONAL CONFERENCE "RICE CULTIVATION AND MALARIA CONTROL IN SUB-SAHARAN AFRICA"

- **Date & Time:** 16:00 - 17:00 (JST), Tuesday, July 19, 2022
- **Venue:** Special meeting room in the House of Councilors building
- **Organizer:** Malaria No More Japan
- **Co-organizers:** Parliamentary Group to End Malaria by 2030, RBM Partnership to End Malaria
- **Language:** Japanese / English  
\*Simultaneous interpretation

#### TIME SCHEDULE

- ▼ 15:45 ZOOM OPEN
- 16:00 EVENT STARTS

- **MC: Fumiharu Ishige**  
Executive Director, Malaria No More Japan
- ▼ **Welcome speech by the Parliamentary Group to End Malaria by 2030 in Japan**
- **Takeaki Matsumoto**  
(Member of House of Representatives, Chair, Parliamentary Group to End Malaria by 2030)
- ▼ **"Food security and human health: the link between rice and malaria in sub-Saharan Africa"**
- **Jo Lines**  
Professor of Malaria Control and Vector Biology, London School of Hygiene & Tropical Medicine (LSHTM)
- **Kallista Chan**  
Research Uptake Manager, RAFT Consortium, LSHTM
- **Kazuki Saito**  
Africa Rice Center



#### Comments

- **Noboru Minagawa**  
Professor of Institute of Tropical Medicine, Nagasaki University
- **Akira Kaneko**  
specially-appointed Professor at Osaka Metropolitan University, Graduate School of Medicine

#### Comments from JICA

- **Sachiko Imoto**  
Senior Vice President of Japan International Cooperation Agency (JICA)

▼ **Announcement of Policy recommendation for the integrated strategy to tackle malaria by Malaria No More Japan, and handover to the Parliamentary Group to End Malaria by 2030 in Japan**

- **Presented by Takahiro Shinyo**  
Chairman of Malaria No More Japan, Professor of Kwansai Gakuin University

▼ 17:00 Close