

# SCIENCE PROVES

# KOVAKKA CAN FIGHT DIABETES

The new drug made of Kovakka leaves (scientific name: *Coccinia grandis*), a tropical vine grown anywhere in the country, has been successfully tested on humans for four years and found to be highly effective and safe. However, over-eating Kovakka without proper medical supervision or advice may reduce blood sugar to dangerous levels.

A team of medical researchers from the Ruhuna University last week went public with a scientific breakthrough of a new drug made of Ivy Gourd, a traditional medicinal plant commonly known as "Kovakka" in Sinhala and "Kovai" in Tamil, which lowers blood glucose.

The traditional knowledge that Kovakka reduces blood sugar has been passed on from generation to generation and there had been many past reports on that, but this was the first time it was medically proven by following the required scientific and ethical protocol.

The new drug made of Kovakka leaves (scientific name: *Coccinia grandis*), a tropical vine grown anywhere in the country, has been successfully tested on humans for four years and found to be highly effective and safe. However, over-eating Kovakka without proper medical supervision or advice may reduce blood sugar to dangerous levels.

Acknowledging the medical invention, the Intellectual Property Office issued a patent for the herbal capsule on July 26, and the research group looks forward to the United States (US) patent as well.

At a time our research and innovation lack motivation, funds and facilities and thus have failed to keep pace with the rest of the world, vigorous and determined attempts to make headway on anti-diabetic activity of our medicinal plants have to be applauded.

The four-member research team includes Prof. Thilak Weeraratna of the Department of Medicine, and Prof. Anoja Attanayake, Prof. Kamani Jayatilaka and Dr. Piyumi Wasana of the Department of Biochemistry.

The research paper, which is also the doctoral research of Dr. Piyumi Wasana, was published in the esteemed 'Phytomedicine' peer-reviewed medical journal in 2021, and she bagged several accolades including the 'Best Innovation Award' of the Sri Lanka Medical Association (SLMA) in the same year.

The new herbal drug to fight Type 2 diabetes will not be in the market immediately as it has more hurdles to cross before commercial production, but once done, it will surely be a proud moment for the Sri Lankan academia and medical fraternity. With the successful outcome of the trial, the research team is now enthusiastically working in that direction while expanding the scope of the research.

## Prevalence

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin (Type 1 diabetes) or when the body cannot effectively use the insulin it produces (Type 2 diabetes). Insulin is a hormone that is essential to control our blood sugar. Those with Type 1 diabetes require taking regular insulin shots to manage their blood sugar levels, whereas the majority with Type 2 diabetes depend on tablets. They may also require insulin in later stages when tablets are not effective.

According to the World Health Organisation (WHO), more than 95 percent of people with diabetes have Type 2 diabetes, and is largely the result of excess body weight and physical inactivity.

The 10th Edition of Diabetes Atlas published last year by the International Diabetes Federation (IDF), an umbrella organisation of over 230 national diabetes associations in 170 countries and territories, mentions that 537 million adults (20-79 years), that is to say one in 10 adults, are living with diabetes worldwide. This number is predicted to rise to 643 million by 2030.

Over time, diabetes may lead to serious damage to the heart, blood vessels, eyes, kidneys and nerves.



Prof. Thilak Weeraratna speaking at a press conference last week along with his research partners Prof. Anoja Attanayake, Prof. Kamani Jayatilaka and Dr. Piyumi Wasana at the Medical Faculty, Ruhuna University.

The WHO explains that the majority of people with diabetes are living in low- and middle-income countries, and that 1.5 million deaths are directly attributed to this metabolic disease each year. The number of cases of diabetes has been steadily increasing over the past few decades.

## Worrying growth of cases

Sri Lanka is no exception. The prevalence of diabetes among adults (18-69 years) in Sri Lanka had been 7.4 percent in 2015 according to the STEP Survey of Non-Communicable Diseases, and medical professionals assume that this rate is above 15 percent now, concerning the same age group. It means that one in every seven adults is diabetic.

Dr. Shanthi Gunawardena, a Consultant Community Physician attached to the Health Ministry's Non-communicable Diseases Unit, said a new survey on this subject was carried out in the country last year, but its findings are yet to be released as the data analysis is still not complete.

She recommended eating a healthy, balanced diet with high natural fibre and low calories at the correct time and regular exercising to maintain an ideal body weight to help manage blood sugar level.

Consultant Endocrinologist and Diabetologist Dr. Manilka Sumanatilleke pointed out that a study conducted four years back in Maradana, a densely populated area in the capital city, found that one in four adults are diabetic.

"The prevalence of Type 2 diabetes is ris-



ing among young people, including school-children. The average age of diagnosis is becoming less as people are now screened for diabetes as part of the application process for driving license, life insurance or visa to enter some countries," he noted, while also underlining that about half of the people with diabetes still go undiagnosed.

He highlighted that more than half who succumbed to COVID-19 in Sri Lanka were diabetic patients. "They showed more complications compared to other COVID-19 patients. They were the most affected subgroup followed by heart patients and kidney transplant recipients who have hypertension," he explained.

Lately, there have been concerns worldwide that people who recover from COVID-19 face a significantly higher risk of developing Type 2 diabetes. "After COVID-19, we saw lots of patients with post-COVID diabetes in Sri Lanka, but we have no idea about the number," Dr. Sumanatilleke corroborated.

He underlined that the cost of diabetes treatment has doubled recently due to the Rupee depreciation.

## Medicinal plants

The group of researchers from the Ruhuna University, who developed a new capsule from Kovakka, in a Review Paper in 2021, listed 18 traditional medicinal plants with anti-diabetic active compounds. Among the list are 'Kothala Himbutu, Dummella, Muva Kiri-Vel or Kuringnan, Kovakka, Madan, Ginger, Kara, Kankun, Bael fruit tree, Snap Ginger, Ceylon Cinnamon, Beetle, Wild Mango (Emberella), Eth Demata, Wal Koththamalli, Circassian Bean (Madatiya), Heen Bovitiya and Wild Passion Fruit'.

In addition, Bitter Gourd (Karavila) and 'Thebu leaves' are also widely believed to be beneficial to manage blood glucose level. These medicinal plants have been widely used in the Sri Lankan traditional healthcare system for hundreds of years.

"Adding them to your meal is recommended but do not overdo it or change the traditional way of preparing them, because exceeding the



Consultant Endocrinologist and Diabetologist Dr. Manilka Sumanatilleke

them. After obtaining their consent, they were recruited to test the pill," he said.

In these experiments, one group of patients received the herbal capsule, whereas the other half received a placebo designed to appear like the real pill. It was done by a third party, so neither the participants nor the researchers knew who was getting the real treatment or placebo. In scientific terms, this is called a 'double-blind, placebo-controlled study', a standard way of testing new drugs. Both groups of patients received additional dietary and exercise advice.

"We checked their average blood sugar levels for a period of three months (HbA1c), and found that the blood sugar levels have come down by 0.6 percent among the category of people who received the real capsule, whereas those who received the placebo showed only a marginal reduction of blood sugar due to dieting and exercising. This reduction of blood sugar from the new drug is the same as that of some Western drugs," Prof. Weeraratna elucidated.

## Next step

He underlined that no participant developed side effects to the new capsule throughout the period of study. Out of the 158 participants, 145 completed the entire trial period successfully, while 13 opted out of the research for various reasons. The minimal sample size required for the study had been 120.

"We want to further this research to other categories of diabetic patients, who are already taking Western medicine. In the latter part of our study, certain chemicals which were previously known to have anti-diabetic properties were isolated, and the final stage will be to identify the exact molecule. It will help commercial production of the new drug in a laboratory. We lack technology for that purpose, but sooner or later, we will arrive at that stage," he expressed.

Insulin, a life-saving discovery which turned 100 years in 2021, was originally derived from the pancreases of cows and pigs. After many years, its molecular structure was found and it could be produced on a mass scale in laboratories without having to kill pigs and cows.

"This pill will only be another addition to the already existing drugs to control diabetes. We do not claim that it will alone manage a progressive disease like diabetes. One will have to take lifelong medicine. Ours is not a miracle cure even though many people would like to hear it in that way," he said, also cautioning against the common man eating too much of Kovakka to get rid of high blood sugar.

"If patients with blood sugar, especially those who are already on medication, overeat Kovakka on top of other medicines they take, that can reduce blood sugar to dangerous levels. We have come across reports of people who have fallen sick or unconscious by over-eating Kovakka. It may even cause death. Also, there is no scientific confirmation yet that Kovakka can prevent one from getting diabetes," he alerted.

Commenting on commercial level production of the new drug, Prof. Weeraratna revealed that two pharmaceutical manufacturing companies have already approached them in that regard. "These companies reached us just four days since our announcement of the invention at a press conference on September 20. We will start discussions with them after consulting the National Science Council. The earlier, the better, and knowing the urgency we are working fast," he summed up.



Patent for the new Kovakka drug

required dose may lead to harmful effects. An Ayurveda physician may give a specific dose to a patient," Dr. Sumanatilleke advised.

The Diabetologist, encouraging more research on native medicinal plants, pointed out that identifying their anti-diabetic properties and isolating them would help mass scale commercial production.

For example, he said, the oldest and still widely used anti-diabetic drug 'Metformin' was originally developed from natural compounds found in a flower in France known as French lilac. After isolating the chemicals, the drug was later produced synthetically in laboratories.

## Clinical trial

Ruhuna University Professor of Medicine Thilak Weeraratna, speaking to the *Daily News* on their research of the efficacy and safety of the Kovakka drug, said that the Biochemistry Department of the University initiated the plant research as far back as 1986. Testing of Kovakka extracts on rats to reduce blood sugar had been the doctoral research of Prof. Anoja Attanayake back in 2000. The next step of testing it on humans was initiated in 2017 with a grant of Rs. 4.7 million from the National Research Council.

All the chemicals in the Kovakka leaf, in powder form, were put in a capsule and it was tested on 158 people with Type 2 diabetes, who were newly diagnosed and whose blood glucose levels were moderately high (125-165).

"These patients were not under medication for diabetes as they were unaware that their blood sugar was high until we screened

### Main types of DIABETES

**TYPE 1 DIABETES**

Body does not produce enough insulin

**TYPE 2 DIABETES**

Body produces insulin but can't use it well

**GESTATIONAL DIABETES**

A temporary condition in pregnancy

#diabetes  
www.who.int/diabetes/global-report