Are Cananut and Human Health*

Arecanut consumption and its effect on human health is of much concern in recent times in India. Even though there were limitations in the epidemiological studies and lack of evidence-based research, voluminous reports were prepared alleging arecanut as a cancer-causing agent based on information available on the internet and submitted before the Supreme Court of India. This has caused much anxiety in the arecanut community, including growers, scientists, policymakers, traders and officials of the developmental agencies. A two-day interactive workshop was conducted recently with regard to research on arecanut and human health, and to identify the shortcomings and prioritize future research.

All the organizations involved in research or continuing research on arecanut and human health aspects, including cancer research institutes, medical colleges and institutes, ayurveda colleges and centres, traditional and agricultural universities, Health Secretaries of all the States and Union Territories, State Directors of the National Health Mission (NHM), and all other concerned were informed about the workshop. In response to our invitation, 25 medical practitioners, 30 scientists associated with arecanut production and value addition, 150 traders and growers, administrators, advocates and officials of developmental agencies attended the workshop.

During the inauguration, P. Chowdappa (Director, ICAR-CPKRI, Kasaragod) enlisted many positive effects of arecanut and unequivocally urged all those concerned to dispel the prevailing negative notions on the crop through evidence-based research. Satheesh Kumar Bhan-dary (NITTE University, Mangaluru) suggested identification and study of areca-only chewers for epidemiological research and emphasized on the need to explore the potential of arecanut in treating Alzheimer’s disease, schizophrenia and other neuroprotective effects. Manjunatha Naik (University of Agricultural and Horticultural Sciences, Shivamogga) considered that it is important to dispel some preconceived notions about arecanut, e.g. it is not good for health. V. V. Bhat (former Secretary to the Government of India) called for need-based research on arecanut with the collaboration of multiple research institutions breaking their respective academic barriers.

Presentations in the workshop were made under five technical sessions, namely (i) phytochemistry, (ii) arecanut in ayurvedic medicine and value addition, (iii) pharmacology I: neuro-protective, hyperglycaemic, wound-healing effects etc., (iv) pharmacology-II: anti-microbial properties, and (v) epidemiological studies.

In the technical session on phytochemistry, papers were presented regarding the chemical constituents of arecanut, their variability with maturity, structural significance, etc. J. Ishwar Bhat (Mangalore University) observed increased chemical components of nuts, including tannins and alkaloids with maturity. X-ray crystallography showed distinct differences in the chemical structure of arecanut and gutkha with low N content in the dried nut compared to the tender nut and gutkha. M. P. Sadashiva (University of Mysore) described how a small change in structural moiety of alkaloids could result in some valuable compounds of medicinal/therapeutic/industrial use (e.g. tannins from arecanut can be converted to ink). Further, antioxidant property of arecanut is found to be significantly influenced by genotype x environment as observed by Laxmanarayanan Hegde (University of Horticultural Sciences, Bagalkot).

In the session on arecanut in ayurvedic medicine and value addition, there were seven presentations. Sathyanarayana Bhat (Ayurvedic practitioner and Sahitya Academy awardee) enlisted the traditional uses of arecanut for treating various ailments. Jayarama Bhat (Formerly with Goa University) highlighted the demerits of some of studies, such as improper dosage of arecanut, sample size and absence of clarity in the methodolo-gies followed. V. V. Bhat suggested that in ayurveda there is a need for systematic research and the findings should be published in high impact factor journals to popularize it as medicine. A product, areca tea, which elicited anti-diabetic activity in Wistar albino rats, was presented by Naveen Chandra (SDM College of Ayurveda and Hospital, Udupi) who requested to revisit the methodolo-gies followed. The mechanism of disease control in ayurveda, i.e. how arecanut chemical constituents are best suited in ayurvedic medicines to ward off doshas vata, pitta and kapha was narrated by M. D. Giridhar Kaje (Prashanti Ayurvedic Center, Bengaluru) and Jeedu Ganapathi Bhat (Jeedu Ayurveda Specialty Hospital, Bengaluru). Are canut and its importance in traditional and folk medicines was highlighted by Hemand Aravind (Santhigiri Research Foundation, Thriruvanthapuram), Subrahmanya Prasad (Nehru Arts & Science College, Kanhangad) and Shankar Bhat Badanaje (Traditional Practitioner, Vittal).

In the pharmacology session, findings from experiments conducted in vitro and animal studies were presented. All parts of the arecanut inflorescence, including flower, seed nut and husk are found to have medicinal properties. In alloxan-induced diabetic rats, Virupanagouda Patil (Bijapur Lingayat District Education Association (BLDEA) College of Pharmacy, Bijapur) observed anti-hyperglycaemic activity of Areca catechu flowers. On the other hand, arecanut husk reduced the tobacco-induced cytotoxic and genotoxic effects as well as oxidative stress in cultured human oral mucosal cells (Manjula Shantaram, Mangalore University) and wound-healing properties (Sukesh Bhat, Kodagu Institute of Medical Sciences, Madikeri). Wound-healing property was further elaborated by Sachidandana Adiga (K. S. Hegde Medical Academy (KSHHEMA), Mangaluru) who showed that extracts of arecanut increased the wound contraction and period of epithelization. From the study he inferred that alkaloid and polyphenols of areca could be used to enhance the healing of burn wounds, leg ulcers and donor skin graft surgery. Antiu-lcerogenic activity of aqueous extract of

*A report on the Interactive Workshop on ‘Are Cananut and Human Health’ held on 24 and 25 July 2018 at ICAR-Central Plantation Crops Research Institute, Kasaragod.
MEETING REPORT

Modern techniques for molecular and morphological characterization of crustaceans*

Taxonomy is one of the oldest branches of science, dating as far back as the human language itself. It has significantly advanced from Aristotle to Linnaeus, and since the modern Linnaean system, many taxonomists have emerged. Molecular techniques have been added to modern taxonomy in recent times. However, at present, the number of taxonomists has dwindled, and this has resulted in a greater number of unknown, undescribed organisms. To address this taxonomic impediment, a two-week long international workshop on modern techniques for molecular and morphological characterization of crustaceans was recently organized. The primary aim of the workshop was to train researchers in modern taxonomic techniques and create a network of crustacean taxonomy experts in India, which is a small group at present. It encompassed talks, practical sessions as well as field trips regarding various aspects of crustaceans. Experts from Germany, Japan, Malaysia and India trained a group of 25 students with varying degrees of knowledge on crustaceans and taxonomy. Subject experts addressed important crustacean taxonomy topics during the workshop.

Morphological characterization is the first step towards identifying a species, and the oldest way of taxonomy. Identification by morphology of prawns, crabs, lobsters, isopods and copepods was taught with great fervour, and pictorial representations as well as handling of the specimens. K. Valarmathi (Zoological Survey of India, Kolkata) and B. Vasesharan (Alagappa University, Karaikudi) conducted lecture sessions on the identification of freshwater prawns and

*A report on the International Workshop on ‘Modern techniques for molecular and morphological characterization of crustaceans’, held during 25 June to 6 July 2018. The workshop was organized by the Centre of Advanced Studies in Marine Biology, Annamalai University and sponsored by the Ministry of Earth Sciences, New Delhi.

P. Chowdappa, K. B. Hebbar* and S. V. Ramesh, ICAR-Central Plantation Crops Research Institute, Kasaragod 671 124, India. *e-mail: balakbh64@gmail.com