

List of RGJ advisors 2020/2021

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Keywords:	Phytochemistry; Functional ingredients; Biological properties; Biomass valorization	

Summary of research:

Plant Bioactive Compound Group (BAC Lab), is established as part of the department of plant and soil sciences. Though is not an official operating unit, the main focus is to highlight the values of plant diversity richness and complexity of northern Thai culture through their phytochemical compositions and local knowledge and employ innovative technology that drive global sustainable development goals (SDGs). Leading by Dr. Sarana Sommano, BAC lab has absorbed this model policy and adopted the theme which has become its research core research strength. Besides, BAC also considered resilience as the backbone research concept which support the flexible growth of Thai economics. BAC delineates a way forward to support the resilience by concerning key productive resources including intellectual, social, environment, human and economic. As a result, more than 50 scientific publications, technology and research transfers, petty patent and reports have been produced from BAC lab. BAC Lab has 11 past and current members in total, comprising of 2 postdoctoral Researchers, 4 higher degree graduates and 5 post graduate students (pHd and Master's programs). In-line with the government plans to transform conventional agro-industries and service sectors toward a value-based and innovation-driven economy, Dr. Sommano and her team try to upgrade plant natural resources through their valuable bioactive ingredients for novel food, feed and pharmaceutical industries along with encouraging manufacturing by-products utilisations.

Under her supervision and research expertise, the BAC research themes are divided into 3 major areas and each group members pursue research on different topics, which are inter-correlated. The first area looks at bioresources for bioactive compounds from the local availability. Within this area, Dr. Sommano and her students use ethnobotany tool to acquire the knowledge of plant utilisations including that of edible or utilisable from the locals of northern Thai culture. The nutritional values and phytochemical properties are also accessed with the recommendation of their uses in the different industries. The ultimate purpose is to value-add the almost forgotten plant species that urge local/native plant conservation. The second area highlights physiology and analytical chemistry of plants of the economic importance. Plant responds to biotic or abiotic stresses through bioactive compound biosynthesis. This biochemical mechanism is beneficial in most case for example as elicitors for bioactive accumulation.

However, this would be adversary in the area of post-harvest physiology where over expression of the mechanism could lead to discolouration. Dr. Sommano has looked at these responses in different plants including ornamentals, herb and fresh cuts. Besides, the advance analyses of aromatic crops have also developed at the BAC lab, and the lab is known as one of the leading research groups that document aromatic profiles of specialty Thai spices. Transitioning to

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sustainability will require innovation, not just in technological and economic terms but also in governance and culture. The last area is the applied technology and innovation in plant science to the industries. For more than 15 years, Dr. Sommano has worked with plant food industries. One area that always interest food manufacturers is to answer the question whether food processing affect the stability of bioactive ingredients. Through that, BAC has also partnered with the Excellent centre of physics at Walailak University and developed dielectric technology for processing and preserving of the natural ingredients. Dr. Sommano has also wrote comments for novel industries of industrial crops through their functional properties.

The following figure illustrate different areas of research interests in plant bioactive ingredients conducted at BAC lab.

