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Evaluation of ohmic heating for sterilization of berry-like fruit juice of mulberry (*Morus nigra*), bignay (*Antidesma bunius*), and jambolana (*Syzygium cumini*)

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Abstract. Increasing awareness on healthy lifestyles escalated the demand for health beneficial products which lead to the creation of minimally processed products using novel technologies. Ohmic heating considered as an emerging sterilization technology which adopt the principle of High-Temperature Short Time (HTST) in thermal sterilization technology. Among the indigenous species of berry-like fruit grown in Indonesia are mulberry (*Morus nigra*), bignay (*Antidesma bunius*), and jambolana (*Syzygium cumini*). This berry-like fruits possess great potential as raw materials for juice industries. In order to evaluate the applicability of ohmic technology for sterilization of juice and purees from these fruits, a stationary ohmic heating system has been built and tested on these three types of fruit juice. The electrical conductivities, heating rates, and system performance coefficients were measured. This study found that the electrical conductivities of all these fruit juices were ranging from 0.128 to 0.430 S.m⁻¹ which increased linearly with temperature. The heating rates were 0.57-0.66 °C /s and the SPC values were ranging from 0.64 - 0.81. This study concluded that ohmic heating is suitable for sterilization of these three types of fruit juices as it could provide a short heating time and a high coefficient of performance. However, the designed ohmic heating system seems to suit better for jambolana juice than for mulberry and bignay juice.

Keywords: ohmic heating, electrical conductivity, mulberry, bignay, jambolana

1. Introduction

Increasing demand for health-promoting products perceived as a great potential for a tropical country like Indonesia with its extensive diversity of exotic fruits. Several berry-like fruits such as mulberry (*Morus nigra*), bignay (*Antidesma bunius*), and jambolana (*Syzygium cumini*) are known as an indigenous species in Indonesia and are underutilized to its optimum potential. Several researchers have reported previously that these fruits possessed an excessive amount of bioactive compounds such as phenolic and anthocyanin which have high free-radical scavenging activities [1-3]. Besides, since these trees can grow well naturally in the wild with a high production yield [4], it can be highly advantageous to be cultivated by local farmers with limited resources.

