I. INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) wax has been a matter of interest, due to its industry application and functionality of one of its compound, long chain alcohols. The surfaces of plants, including sugarcane, are coated with several layers of lipophilic material, the outermost being the epicuticular wax. It serves many purposes, for example to limit the diffusion of water and solutes, while permitting a controlled release of volatiles that may deter pests or attract pollinating insects. It also provides protection from diseases and insects, and helps the plants resist drought.

Long chain alcohols, which is well-known as policosanols, is a group of long chain (C20–C30) aliphatic primary alcohols which is of a great interest due to their health beneficial effect for human health, such as reducing platelet aggregation, reducing low-density lipoprotein levels in blood, inhibiting cholesterol synthesis, and ergogenic properties (Castano *et al.* 2003; Singh *et al.* 2006; Taylor *et al.* 2003). Long chain aldehydes as well as alcohols are one of main component of natural wax extracted from plant (Adhikari *et al.* 2006). Straight chain aldehyde also was known as one of lipid biomarker in leaves and roots of plant (Jansen *et al.* 2006).

Recently, research in policosanol analysis with several kinds of materials and techniques have been well reported (Adhikari *et al.* 2006; Wang *et al.* 2007; Wu *et al.* 2007). Sugarcane and its wax have been reported contain a number of policosanols used as major source in commercial product of policosanol (Irmak *et al.* 2006; Morrison *et al.* 2006; Nuissier *et al.* 2002). However, only a few information of long chain aldehyde analysis are published, especially for
sugarcane and its products.

*Kokuto*, a unique brown cane sugar, has been traditionally produced in Okinawa, Japan from sugarcane by non-centrifugal method, without molasses removing process. This product has been reported to contain some antioxidants and phenolic compounds (Takara *et al.* 2002, 2003). It is then expected that *Kokuto* as one of cane food product contain much wax components, including policosanol which has beneficial health effect as described above.

Indonesian sugar industry, back to the seventeenth century, was known as one of the oldest and biggest sugar industry in the world. It reached its zenith in the early-thirties when 179 factories produced nearly 3 million MT of sugar annually. Following several up and down conditions in many periods of times, since 1967, Indonesia has reverted to a net sugar importer position and since the mid-eighties imports have continued to rise. The present average cane yields are thus about 7.5% (Hadisaputro *et al.* 2008). Thus this study would explored information of functional compounds potentially contained in sugarcane and brown sugar. Sugarcane might be potent sources for high value added products of sugarcane derivates, such as cane wax and policosanol.

The main purpose of this study is to determine wax, policosanol and aldehyde compositions in sugarcane and *Kokuto*, Okinawan brown sugar, with TLC, HPLC-ELSD, GC-FID and GC-MS. Some specific aims were applied in this study, i.e.:

- to determine the effect of extraction methods and times on the policosanol and long chain aldehyde contents of sugarcane rinds and *Kokuto*,
- to determine the effect of sugarcane cultivars on wax, policosanol and long chain aldehyde contents and compositions of the sugarcane rinds,
c. to determine policosanol and long chain aldehyde contents in different parts of sugarcane,

d. to determine the effect of sugarcane harvesting time on the policosanol and long chain aldehyde contents of the sugarcane rinds,

to determine the effect of *Kokuto* types on the policosanol and long chain aldehyde contents of the *Kokuto*, and

to determine the effect of *Kokuto* production types on the policosanol and long chain aldehyde contents of the *Kokuto*. 