KOMBUCHA AND JAMU HERBAL DRINKS FOR BODY HEALTH, BETWEEN OLD AND YOUNG TASTE

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Abstract

Kombucha and Jamu were the herbal beverages famous nowadays. Those two beverages famous because claimed that it has health benefits when consumed. The trend about Herbal beverages consumptions were appearance anymore because the reports of "side effect" of synthetic chemicals used in medic. The herbal fitochemicals believed has minimum side effect and low toxicity cause the consumption became trend of "health Lifestyle". In this research produce the Kombucha and Jamu from the herbals and fruits. Phytochemical characterization of the fresh organic and it products (Jamu and Kombucha) showed that those products contains phytochemicals recommended for body heatlh. But from the organoleptic test, the Kombuca preffered by the Teens than Jamu. The reason were because Jamu appearance, taste and aroma more similar too the spices than medicine. Based on this results then recommended to produce the jamu which closer too the taste of the teens.

Key Words: *Beverages, Herbals, Kombucha, Jamu, Phytochemicals*

1. INTRODUCTION

The consumption of herbal drinks became a "trend lifestyle" nowadays [1][2][3]. This trend were appearance because the popular promotion about "health lifestyle" with herbal drinks consuptions in news and social media [1][2][3]. The promotion about healthy lifestyle were increasing following the increasing of degenerative health problems such as Diabetes, Stroke, Hypertension, and many others [1][2][3][4]. The another factors causing the promotion of health lifestyle was the immune disorders mainly because of the global pandemic (COVID19) along 2020-2021 [3][4]. Those factors were the main factors causing the increasing of health lifestyle lately, and among the parameters recommended in those promotions were "Herbal Beverages (Herbal Drinks)" [2][3][4].

In Indonesia, the consumption of herbal drinks once became a culture and part of daylife [3][4]. The youngers and Teens nowadays commonly not consumption the herbals (mostly beverages) enymore even not recognizing it [3][4]. The local knowledge about the herbal drinks almost forgotten, the main reasons of the teens causing this were "because the herbals has bitter taste then only consumed by the elders" [2][3][4]. This symptoms causing many youngers and teens lost the knowledge about herbal medicine including herbal drinks [1][2][5]. Indonesian government already prepare for this condition by founding many of bureau of herbal phytopharmaca based on National Regulations [6][7][8]. This bureau were producing, cultivating, maintenance, developing, and distributing the herbals and it products (herbals medicines), even empowering the farmers and activists wth the permission of the national regulation [9][10][11].

The herbal medicine still exist because proved by chemically and toxicity assay it has minimum side effect but it slow in healing [1][2][3][4][5]. In Indonesia, the herbal product used as medicine, herbal beverages, and another products were classified into 3 class: *Fitofarmaka* (Phitopharmaca), *Obat Herbal Terstandar* (Stadarized Herbal Medicines), and *Jamu* (Jamu) [5][12][13][14]. Those product has specific symbols (for the packages) to recognizing it [15][16][17], those symbols showed at Figure 1.

Figure 1. The Spesific Symbol for Phytopharmaca, Herbal Medicines and Jamu Based On The Regulation of Ministry of Health of Indonesia [6][7][8][9][10][11][12][13][14][15][16][17]

Even the herbal products proved chemically can increasing the heathness quality of human body [1][2][3][4][5], but the taste and the stigma about the the herbal products made it not popular to the teens [1][2][5][18][19]. Until 10 years later starting from the report about the side effect of the synthetics compounds causing the carsinogenic effect [1][2][3][5][18][19], after that period mostly the product of medicine and cosmetics initiating and promoting the apply of the herbals [18][19][20][21][22][23]. In the herbal medicinal case, the reintroducing about "Kombucha" products was one of innovation to increasing the apply of herbal beverages [24][25]. Kombucha made from the fermentation of herbal compounds then producing the beverages with sweet and sour taste also Ester flavor [24][25]. The mix taste of Kombucha were popular for the teens [24][25].

2. METHODS

2.1. Time and Location

2.2. Instruments and Materials

The chemicals using in this research were aquades / aquabides, Methanol, Ethanol, Acetic Acid, Aceton, Ethyl Acetate, n-Hexane, Cloroform Petroleum Eter, Acetonitril, Ascorbic Acid, $KFeCN_6$, $FeCl_2$, $FeSO_4$, Metilen Blue, Quercetin and Katekin. All of materials classified in Pro Analysis (PA) levels. The instruments using in this research were sonicator, spectrophotometer UV-Vis, oven, and incubator (biochemical incubator).

The samples / raw materials in this research were Soursoup, Snakefruit, Tea, Turmeric, Tamarind, and Palm Sugar obtained from central market Pasar Raya Salatiga.

2.3. Sample

2.3.1. Preparation and Treatments

The preparation of sample treated by peeling the fruits, turmeric and tamarinds. The fruits and tamarinds separated from the seeds [3][4][18][19][24][25]. Those compounds then grinded until became juicy [3][4][18][19][24][25].

2.3.2. Kombucha (B_1)

The Kombucha made started from boiling the water then use it to brewing the 30g of (dry) Tea, the volume of tea fill up to 1L [24][25]. The Tea added to the each fruit juices, then mixing it until homogeny [24][25]. Stewing the mixture until boiling then add 1g sugar, then the mixture cooling in room temperatures [24][25]. Added 10g Kombucha starter when the temperature of mixture were equivalent to room temperatures [24][25]. Incubated it along 14 days [24][25]. Kombucha starter showed at Figure 1

Figure 1. Kombucha's Starter

2.3.3. Jamu (B_2)

The Jamu made started from boiling the water with 250g Turmeric pulp, when the mixture boiling, added the 200g Tamarind pulp and 200g Palm Sugar [3][18][19]. Continue to boiling until the mixture became homogeny [3][18][19]. After boiling, cooling the mixture to room temperatures then add 1g of Pectin [3][18][19].

The code of each treatment showed at Table 1.

Table 1. The Treatments

	Code	**Samples Name**	
B_1 = Beverage 1 = Kombucha	F1 = Fruit 1	Sorsoup	Annona muricata
	F2 = Fruit 2	Snakefruit	Salacca zalacca
	T = Tea	Tea	Camellia sinensis
	Code Treatments	Definition	Composition
	KF1	Sorsoup Kombucha	30g Dry Tea (Brewed with Boiling Water) + 500g Fruit + 1g Sugar + Starter Kombucha
	KF2	Snakefruit Kombucha	
	KT	Tea Kombucha	30g Dry Tea (Brewed with Boiling Water) + 1g Sugar + Starter Kombucha
	Code	**Samples Name**	
B_2 = Beverage 2 = Jamu	TUM	Turmeric	Curcuma domestica
	TAM	Tamarind	Tamarindus indica
	PS = Palm Sugar	Palm Sugar	-
	Code Treatments	Definition	Composition
	J0 = Jamu 0	Jamu without Enzyme	250g Turmeric + 200g Tamarind + 200g Palm Sugar
	JE = Jamu + Enzyme	Jamu plus Pectin	250g Turmeric + 200g Tamarind + 200g Palm Sugar + 1g Pectin

2.4. Characterization

2.4.1. Moisture

The moisture of the samples measured automatically using *Automatic Moisture Analyzer* with measurements intervals 15 minutes [23][26].

2.4.2. Ash and Volatiles

The ash contain measured by incernerating the Turmeric using Furnace at 550^{o}C along 3 hours [23][26]. The organic compounds obtained from the differences between the Turmeric mass against it ash mass [23][26]. The volatile Carbons contains obtained from the multiplying of organic compounds against 0,58 [23][26].

2.4.3. Organic Fiber

The Organic fiber contains measured by maseration methods, the dry shredded Turmeric were maserated sequentially in the 100ml NaOH 5% (w/v) and HCl 5% (v/v) to eliminated another materials and leaving the fibers [23][26][27][28][29][30]. The Fiber's mass were weighed and notice as crude fiber contains [23][26][27][28][29][30].

2.4.4. Alcohol

Take 10mL sample and added 10mL $K_2Cr_2O_7$ then mixing until homogeny [23][26][27][28][29][30]. Added 1-2 drops indicator Amilum-KI then titrated with $Na_2S_2O_3$ until the black color disappear [23][26][27][28][29][30].

2.4.5. Organic Acid

Take 10mL sample then added 10 drops Phenolphtalein indicator, titrated with NaOH 0,1N until the colors turn to purple or pink [23][26][27][28][29][30].

2.4.6. Glucose

1g of each samples then dissolved into 10mL HCl 25% (v/v) then take 10mL and deluted to 100ml with aquades [23][26][27][28][29][30]. Take 10ml sampel solution then add 5ml antrone 0,5% (w/v in H_2SO_4), incubated about 15 minutes in room temperature [23][26][27][28][29][30]. The absorbantion measured using spectrophotometer UV-Vis at λ 630nm [23][26][27][28][29][30].

2.4.7. Flavonoid

The 10mL water crude extract (from each samples) were diluted to 100mL by water, then added 1mL $FeCl_3$ 1% (w/v) and incubated 10 minutes in room temperature [23][26][27][28][29][30]. The absorbansion of the samples measured using spectrophotometer Uv-Vis at λ 435nm then plotted in Quercetin : $AlCl_3$ standard curve [23][26][27][28][29][30].

2.4.8. Saponin

The 10mL water crude extract (from each samples) were diluted to 100mL by water, then added 1mL NaCl 0,9% (w/v) and incubated 10 minutes in room temperature [23][26][27][28][29][30]. The absorbansion of the samples measured using spectrophotometer Uv-Vis at λ 650nm then plotted in Metilen Blue standard curve [23][26][27][28][29][30].

2.4.9. Tanin

The 10mL water crude extract (from each samples) were diluted to 100mL by water, then added 0,5mL $FeCl_3$ 1% (w/v) and incubated 10 minutes in room temperature [23][26][27][28][29][30]. The absorbansion of the samples measured using spectrophotometer Uv-Vis at λ 235nm then plotted in Catechin : $FeCl_3$ standard curve [23][26][27][28][29][30].

2.5. Antioxydant

2.5.1. IC 50% DPPH

The IC_{50} of each samples measured using 1mL DPPH (1,1-Diphenyl-2-Picrylhydrazyl) 0,5M by spectrophotometer UV-Vis at λ 517nm [23][26][27][28][29][30].

2.5.2. Fe Chelation (Fe-Ascorbic)

The content of antioksydant were measured using Ascorbic Acids : $FeCl_3$ by spectrophotometer UV-Vis at λ 720nm [23][26][27][28][29][30]. 1ml $FeCl_3$ 1% (w/v) were added to 10mL of the samples then incubated 10 minutes in room temperature [23][26][27][28][29][30]. After incubated added 1mL Ascorbic Acid 1% (w/v) [23][26][27][28][29][30]. The absorbansion of samples were measured and plotted to the Ascorbic Acids standard curve [23][26][27][28][29][30]

2.5.3. Fe Reduction (KFeCN)

The reduction ability of each samples measured using $KFeCN_6$ by spectrophotometer UV-Vis at λ 700nm [23][26][27][28][29][30].

3. RESULTS AND DISCUSIONS

The substrates used to made Kombucha in this research using Snakefruits, Soursop fruits, and Tea. Those fruits used because the sugar (glucose and fructose) need as substrates in biochemical reaction to produce Esters in Kombucha [24][25][31]. The Overall processing of fruits became Kombucha showed at Figure 1.

Kombucha give appearance based on it substrates (fresh material) such as fruits and leafes [24][25][31]. The kombucha give nice appearance, color, taste and flavor then causing this beverages popular to the teens [24][25][31]. It give mixture taste from the sweet sugars, organic acids, alcohols, esters (from fermentation), and another organic chemical [24][25][31]. Because has good taste then it became popular [24][25][31].

Indonesian culture also has one local medicinal beverage call "Jamu" [3][18][19][31][32]. Jamu was one of medical beverages famous for the elders but not for the young [2][3][18][19][31][32]. Jamu sometimes give bitter taste because of the composition [3][18][19][31][32]. Jamu made from the mixture of herbals and non herbals (eggs, milk, *etc*) organic component [3][18][19][31][32], this mixture causing various taste (including bitter) because the mix of chemical contains of each fresh material [33][34]. The jamu processing of this research showed at Figure 3.

Figure 2. The Kombucha's Processing

Figure 3. Jamu Processing

The herbals in jamu composition commonly used as "spices", such as turmeric, zingiber, cinnamon, pandan and another herbals. This fresh spices rich of chemical contains then when it mixing together with the non herbals, the chemical also mixing then causing specific taste and flavor [27][33][34], the existence of the specific taste (sometimes bitter) and flavor causing jamu not too preffered by the young and teens [2][3][27]. Even the characterization of jamu proved has benefits for the body health [18][19][35][36][37] but the taste, appearance and flavor not interesting [2][3]. Sometimes the color too strong, the taste too strong also the smell then claimed as "Old Tastes" [3]. Jamu and Kombucha belongs to herbal drinks being widely reviewed nowadays [1][2][3][18][19]. This beverages lately became popular because the initiation to "Back to Herbals" [1][2][3]. This initiation causing by several report of consument report which reporting about the bad side effect of the synthetic chemical compounds [38][39][40][41][42]. Then the consuments initiating to consume the herbals because it

minimum side effect [1][2]. To prove the chemical contains in Jamu and Kombucha then treated the characterization to the herbal drinks. The characterization started from the fresh (raw) organic components, the results showed at Table 2.

Table 2 Characterization ($\bar{X}$ ± SE)

Samples		Characterization ($\bar{X}$ ± SE)				
		Moisture (%)	Ash			Organic Fiber (g/g)
			Crude Ash (g/g)	Volatile Organic (g/g)	Volatile Carbon (g/g)	
Soursoup	F1	19,4 ± 1,3083	0,1990 ± 0,0030	0,8010 ± 0,0030	0,4646 ± 0,0018	0,1538 ± 0,0008
Snakefruit	F2	20 ± 0,7071	0,2026 ± 0,0009	0,7974 ± 0,0009	0,4625 ± 0,0005	0,1581 ± 0,0011
Tea	T	14,64 ± 0,2400	0,4504 ± 0,0166	0,5496 ± 0,0166	0,3188 ± 0,0096	0,2529 ± 0,0011
Turmeric	TUM	18,64 ± 0,2293	0,2831 ± 0,0088	0,7169 ± 0,0088	0,4158 ± 0,0051	0,2064 ± 0,0026
Tamarind	TAM	21,28 ± 0,7684	0,2418 ± 0,0024	0,7582 ± 0,0024	0,4398 ± 0,0014	0,2003 ± 0,0005
Palm Sugar	PS	15,78 ± 0,3929	0,1438 ± 0,0044	0,8562 ± 0,0044	0,8562 ± 0,0044	-

The crude contains of each fresh component showed at Table 3 mean that those materials pottentialy rich of organic chemical contains can processing to increasing it biochemical benefits. Then to determinating the specific chemicals, need the specific chemical test to determinating each of the chemical contains of each components and it products (Kombucha and Jamu). The results showed at Table 3 and Table 4.

Table 3. Chemical Contains of The Fresh Components and It Products (Kombucha and Jamu)

Treatments		Crude Chemicals ($\bar{X}$ ± SE)			
		Fats		Alcohol (g/g eq)	Organic Acids (g/g eq)
		P-Eter (%)	n-Hexane (%)		
B_1	F1	-	-	0,0303 ± 0,0015	0,0354 ± 0,0027
	KF1	-	-	0,0354 ± 0,0030	0,0375 ± 0,0020
	F2	-	-	0,0060 ± 0,0006	0,0247 ± 0,0022
	KF2	-	-	0,0140 ± 0,0004	0,0310 ± 0,0036
	T	0,0104 ± 0,0006	0,1309 ± 0,0078	0,0031 ± 0,0011	0,0056 ± 0,0005
	KT	-	-	0,0110 ± 0,0011	0,0157 ± 0,0047
B_2	TUM	0,5910 ± 0,0048	0,8515 ± 0,0191	-	0,0260 ± 0,0036
	TAM	0,2107 ± 0,0028	0,6070 ± 0,0145	0,0383 ± 0,0035	0,0404 ± 0,0030
	PS	-	-	0,0387 ± 0,0046	0,0376 ± 0,0021
	J0	-	-	-	0,0289 ± 0,0054
	JE	-	-	-	0,0290 ± 0,0006

Table 3 showed that the raw fresh organics and it products containing the hydrocarbon contains. The organic acids and alcohols contains has increasing from the fresh to the fermentation products in Kombucha formulations mean that the fermentation in this research were success to transforming the sugars to alcohols. But the Table 3 also showed the alcohol contains in Tamarind (TAM) and Palm Sugar (PS), the appearance of alcohol contains probably causing by the reagent (from titration) used to determine were sensitive to "OH" groups while OH groups nol only OH in Alcohol, but also free hydroksil (OH) from Glucose in Palm Sugar, OH-Carboxil / Ester, OH-Acetic,

OH-Fructose or another OH formation contains in Tamarind. But whatever it takes, the OH detected as alcohols still the phytochemical which has benefits if consumed it as Kombucha or Jamu.

Table 4. The Specific Phytochemicals Contains and It Antioxidant Activity

Treatments		Characterization ($\bar{X}$ ± SE)						
		Phytochemical				Antioxydant		
		Reduction Sugar (g/g eq)	Tanin (g/g eq)	Flavonoid (g/g eq)	Saponin (g/g eq)	Chelation: Fe-Ascorbic (g/g eq)	Reduction: KFeCN (g/g eq)	IC 50% DPPH
B_1	F1	0,0331 ± 0,0006	0,0465 ± 0,0013	0,0374 ± 0,0009	0,0616 ± 0,0019	0,0644 ± 0,0015	0,0487 ± 0,0007	0,3387
	KF1	0,0368 ± 0,0005	0,0490 ± 0,0006	0,0406 ± 0,0004	0,0609 ± 0,0025	0,0693 ± 0,0016	0,0502 ± 0,0007	0,8480
	F2	0,0256 ± 0,0005	0,0634 ± 0,0005	0,0385 ± 0,0011	0,0548 ± 0,0032	0,0661 ± 0,0016	0,0507 ± 0,0009	1,7624
	KF2	0,0372 ± 0,0007	0,0494 ± 0,0005	0,0423 ± 0,0006	0,0616 ± 0,0025	0,0594 ± 0,0021	0,0525 ± 0,0009	0,8378
	T	0,0239 ± 0,0004	0,0719 ± 0,0008	0,0425 ± 0,0003	0,0619 ± 0,0023	0,0707 ± 0,0009	0,0548 ± 0,0009	0,5071
	KT	0,0334 ± 0,0006	0,0604 ± 0,0008	0,0440 ± 0,0004	0,0611 ± 0,0027	0,0707 ± 0,0008	0,0558 ± 0,0007	1,4430
B_2	TUM	0,0209 ± 0,0013	0,0734 ± 0,0011	0,0449 ± 0,0006	0,0568 ± 0,0033	0,0748 ± 0,0008	0,0535 ± 0,0011	0,8241
	TAM	0,0331 ± 0,0008	0,0777 ± 0,0004	0,0456 ± 0,0006	0,0610 ± 0,0004	0,0718 ± 0,0020	0,0534 ± 0,0005	0,3820
	PS	0,0371 ± 0,0006	0,0746 ± 0,0008	0,0465 ± 0,0003	0,0557 ± 0,0014	0,0690 ± 0,0013	0,0554 ± 0,0006	0,51876
	J0	0,0299 ± 0,0063	0,0618 ± 0,0007	0,0446 ± 0,0004	0,0784 ± 0,0013	0,0716 ± 0,0014	0,0548 ± 0,0010	0,1779
	JE	0,0298 ± 0,0052	0,0619 ± 0,0009	0,0441 ± 0,0006	0,0784 ± 0,0016	0,0722 ± 0,0006	0,0532 ± 0,0007	0,5602

The characterization at Table 4 aims to determined the organic chemicals potentially related to the conditions of the herbal drinks produced in this research such as the cause of bitter taste, acid taste, sweet flavor, and another aromatic flavors. Table 4 showed the data related to the Table 3, the organic causing acid conditions at Table 3 (Organic Acids) discovered at Table 4. In Tanbe 4 the phytochemicals separated to specific: Tanin, Saponin, and Flavonoid, and then measuring it ability to supressing the activity of Reactive Oxygen Species (ROS). The ROS also called as "Free Radical" causing bad effect to the body health then need to minimize. The $IC_{50\%}$ of each materials measured aims to describe the antiradical activity. IC 50 mean that the lower concentration of active compounds can inhibiting 50% of ROS exposure. Higher the scale of $IC_{50\%}$ mean that the antiradical activity belongs to weak. The IC_{50} 0f each organic materials and it products has range between 0,1-n to 1,-n., mean that this antiradical activity belongs to strong. But just like another phytochemicals, the fresh were showing stronger activity than it products. Even the herbal drinks such as Kombucha and jamu has benefits to human body, but it need design the appearance. Because of it the physical conditions must also determine showed at Table 5

Table 5. Physical Conditions of The Herbal Beverages

Beverages		pH	Brix (%)	Viscosity (P.a)
B_1	KF1	6,2	10	1,5
	KF2	6,2	10	1,5
	KT	6,6	11	1,5
B_2	J0	6,5	-	1,5
	JE	6,4	-	1,5

The pH of each beverages belongs to acid because it phytochemicals. Then the "Brix" refract index showed 10 and 11% overall, mean that the Kombuchas has muddy color not transparent. While the jamu, the Brix not detected because muddy more than the Kombuchas, even the jamu already added wit Pectine (JE), but the enzyme not strong enough to reducint it color. The muddy appearance of the Jamu causing by many coagulations due the mixing process causing precipitation.

The Jamu and Kombucha from this research were tested to the Teens by Organoleptic test to 35 teenagers with age rane 18 – 22 years old. The organoleptic test including Taste, Flavor (Aroma), and Appearance (Color). The results showed at Table 6.1 – Table 6.3

Table 6.1. Organoleptic Test Results for Taste

Beverages		Realy Disliked Taste		Disliked Taste		Some Liked		Like		Realy Like Taste	
		Freq	Reason	Freq	Reason	Freq	Reason	Freq	Reason	Freq	Reason
B_1	KF1	-	-	80%	Bitter Taste	20%	Bitter Taste	-	-	-	-
	KF2	20%	Astrigent Taste	80%	Bitter Taste	-	-	-	-	-	-
	KT	5%	Astrigent Taste	90%	Astrigent Taste	5%	Bitter Taste	-	-	-	-
B_2	J0	20%	Astrigent Taste	10%	Bitter Taste	70%	Sweetish	-	-	-	-
	JE	15%	Bitter Taste	5%	Sweetish	80%	Raw Taste	-	-	-	-

Table 6.1 showed that the Taste of the Herbal Beverages still not recommended, this is causing by the phytochemical contains (showed at Table 4) producing astringent, bitter and acid taste. Mean that the production process of jamu and kombucha (fermentation and mixing) not reducing much the phytochemical contains. Expecially for the kombucha, maybe need the more long fermentation time to producing the sweet taste. The organoleptic test about appearance of the herbal beverages showed at Table 6.2

Table 6.2. Organoleptic Test Results for Color and Appearance

Beverages		Realy Disliked		Disliked		Some Liked		Like		Realy Like	
		Freq	Reason	Freq	Reason	Freq	Reason	Freq	Reason	Freq	Reason
B_1	KF1	-	-	-	-	5%	Muddy	80%	Looks like juice	15%	Looks like pulpy juice
	KF2	-	-	12%	Dark Colored	2%	Less Colorful	8%	Soft Color	78%	Nice
	KT	-	-	-	-	-	-	55%	Looks as real Kombucha	45%	Looks like Tea
B_2	J0	12%	Color too Thick	75%	Looks Bitter based on the Color	13%	Looks like Spice Liquid	-	-	-	-
	JE	88%	Looks like Watered Cappuccino	7%	Looks like Spice Liquid	5%	Looks like food gravy	-	-	-	-

The Table 6.2 showed that Kombucha preffered to the teens than Jamu based on it color and appearance. The color and appearance of Jamu looks muddy because koagulation and precipitation

during mixing. The chemical contains mixing together causing strong color of herbal compounds dominated by yellow from Turmeric. The dark yellow from Turmeric causing by the stable mix of Curcumin and Bis-Demetoxy Curcumin. This dark yellow causing jamu looks like food gravy (soup) than medicine by the teens.

Table 6.3. Organoleptic Test Results for Flavor and Aroma

Beverages		Realy Disliked		Disliked		Some Liked		Like		Realy Like	
		Freq	Reason	Freq	Reason	Freq	Reason	Freq	Reason	Freq	Reason
B_1	KF1	-	-	-	-	-	-	5%	Sweet Soft Aroma	95%	Sweet Soft Aroma
	KF2	-	-	-	-	-	-	16%	Sweet Soft Aroma	74%	Sweet Soft Aroma
	KT	-	-	-	-	5%	Too Fragrant for Tea Scent	90%	Sweet Soft Aroma	5%	Sweet Soft Aroma
B_2	J0	65%	The Herbal Aroma too Strong	15%	Dominated by the Turmeric Aroma	10%	Smells like Spices	10%	Nice Herbals Aroma	-	-
	JE	88%	Smells like Fish Soup	12%	The Herbal Aroma too Strong	-	-	-	-	-	-

The Table 6.3 also showed the similar role with Table 6.2 that the Kombucha preffered to the teens during it flavor than Jamu. It causing by the fermentation in Kombucha processing causing the Esterification of the phytochemicals in the frash organic materials. The Esters (Alkyl – Alkanoic / Carboxilic) from fermentation causing the Kombucha smell "sweet" and fragrant. This fragrant aroma causing the Kombucha more popular to the teens.

The Table 6.1 – Table 6.3 showed that even the herbal beverages has health benefist by it phytochemical contains, but to made the young generations consumed it need the processing to made the nice appearance, taste and aroma. Those 3 organoleptic parameters must considered because without it will be difficult to pass on knowledge about the herbals for the young generations. In the paradigm of the young generations, the raw herbal medicines (such as Jamu) only suitable for the elders because the taste, aroma and appearance causing "old feel".

4. CONCLUSION

The Jamu and Kombucha beverages produced in this research showed that those beverages still contains the phytochemicals (and it modified) which has benefits for health if consumed. But the organoleptic test showed that the beverages still not recommended for marketing mainly because it taste. The taste still not recommended because the contain of phytochemicals not totally modified and reduced causing bitter and astringent taste. Because of it then still need the long process of chemical modification to producing the Herbal beverages with recommended taste, aroma and appearance.

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