PENULISAN ARTIKEL ILMIAH:

Nur Hidayat

CPL – CPMK – Sub CPMK

- CPL: Mampu merancang ~~komponen sistem, sistem, proses, dan/atau produk untuk memenuhi kebutuhan dalam kendala yang realistik dengan menerapkan~~ metode, ketrampilan, dan alat keteknikan moderen dalam praktek teknik agroindustri cerdas yang berkelanjutan berbasis kearifan lokal dan berwawasan global.
- CPMK: Mahasiswa mampu menulis artikel ilmiah hasil penelitian.
- Mahasiswa mampu menulis metode, hasil dan pembahasan artikel ilmiah (Sub-CPMK 15)
- Pustaka: Katz, M.J., 2009. *From research to manuscript: A guide to scientific writing*. Springer Science & Business Media.

Bahan dan Metode

- Penelitian yang baik harus menunjukkan bagaimana bahan yang digunakan (termasuk darimana atau bagaimana bahan diperoleh)
- Penjelasan bahan yang digunakan akan menarik pembaca untuk melihat cakupan penelitian kita
- Sajikan secara lengkap alat dan bahan
- Alat yang disajikan adalah alat yang mempengaruhi hasil, bukan semua alat
- Bahan dan metode memberikan definisi dan makna pada data Anda.
- Metode harus jelas
- Prosedur percobaan detil

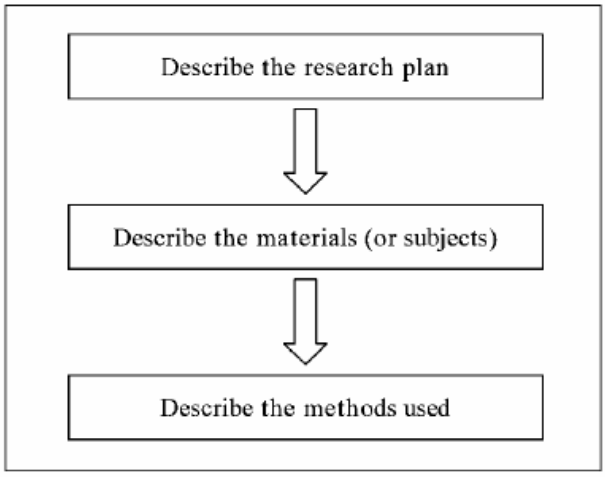

Fig. 1 The three-step process of writing the materials and methods.

Contoh penulisan bahan kimia

- **Sodium chloride (NaCl)** was obtained from a local supermarket.
- **Anhydrous ethanol, coomassie brilliant blue G-250, coomassie brilliant blue R-250 and ammonium ferric sulfate (NH4Fe(SO4)2·12H2O)** were purchased from Tianjin Fuyu Fine Chemical Co., Ltd (Tianjin, China).
- **Potassium thiocyanate (KSCN), silver nitrate (AgNO3) and nitrate (HNO3)** were obtained from Sinopharm Chemical Reagent Co., Litd (Shanghai, China).
- **Sodium dodecyl sulfate (SDS) and 8-aniline-1-naphthalenesulfonic acid (ANS)** were supplied by Sigma (St. Louis, MO, USA). Unless indicated otherwise, the chemicals were analytical grade and were used as received.
- Sumber: *LWT - Food Science and Technology 88 (2018) 119–125*

Contoh menulis material: 1.

- Pickles (cucumber, mackdos, and mixed pickles of cucumber, carrot and cauliflower) were randomly obtained from 8 major retails in Riyadh, Saudi Arabia (Latitude and longitude coordinates are: 24.774265, 46.738586).
- Fresh samples were taken in their purchasing containers and transported to a laboratory in an insulated ice box (4 ± 2 C) within 1 h of collection, while the canned samples were brought in their original containers without cooling.
- All samples were immediately analysed upon arrival for biochemical and microbiological analysis.
- (sumber: A.H. Aljahani / Journal of the Saudi Society of Agricultural Sciences 19 (2020) 415–421)

Contoh bahan 2

- Fresh duck eggs, ranging from 55 to 65 g, were purchased from a local market.
- These eggs were cleaned with flowing tap water and checked for any crack on egg shell prior to being salted.
- The sodium chloride aqueous solution used for salting was prepared by dissolving 20 g sodium chloride into each 100 g of cool boiled water, and then the fresh duck eggs were soaked and immersed into this solution with a sealed container (Wei & Tong, 2011).
- During processing, ten eggs were taken out at 5, 10, 15, 20, 25 days for determination and analysis, respectively.
- Salted duck eggs were placed into boiling water for 10 min poaching. After that, egg white of each sample was carefully separated from egg yolk for texture profile determination immediately. The rest of separated samples wrapped by preservative film were kept at 4 °C refrigerator until instrumental identification.

Rancangan percobaan: RSM

- Optimization of extraction of phenolics from whole grain and bran of soft and hard wheat in aqueous ethanol was carried out using RSM (Montgomery, 2001; Myers &Montgomery, 2002).
- A three-factor and a three level face-centered cube design (FCD) consisting of seventeen experimental runs was employed including three replicates at the center point.
- The effects of unexplained variability in the observed response due to extraneous factors were minimized by randomizing the order of experiments. The design variables were the solvent composition (X1, %, v/v, water/ethanol), extraction temperature (X2, C) and extraction time (X3, min) while response variable was total antioxidant activity (TAA).
- Sumber: Food Chemistry 93 (2005) 47–56

Metode Faktorial

Table 1
High and low levels of factors

Factor	Species			
	Cr^{3+}		Cr^{6+}	
	Low level	High level	Low level	High level
pH	2.0	6.0	1.0	3.0
Temperature (°C)	29	55	29	55
Initial concentration (mg/L)	10	1200	10	1200

Sixteen duplicate experiments were carried out: eight for Cr^{3+} and eight for Cr^{6+}. All possible combinations of variables, called factors in the jargon, were used, and a matrix was established according to their high and low levels, represented by +1 and −1, respectively.

Analisis statistika yang digunakan sebaiknya dicantumkan

2.10. Statistical analyses

All experiments were performed at least three times. The data are presented as means ± standard deviations. Analysis of variance (ANOVA) was performed using the SPSS ver. 25.0 software (IBM Corp., Armonk, NY, USA) and significant differences were evaluated using Tukey's test at a level of $p < 0.05$.

Cara pengujian parameter tulis dengan jelas

2.8. Measurement of total phenolic (TP) content and antioxidant activity

2.8.1. TP content

The TP content of each sample was determined using the Folin–Ciocalteu method with slight modifications (Muhammad, Praseptiangga, Van de Walle, & Dewettinck, 2017). Each 1.0 mL sample was supplemented with 7.5 mL distilled water. After adding 0.5 mL Folin–Ciocalteu reagent, the mixture was allowed to stand at 25 °C, and then 1.0 mL 35.0% (w/v) sodium carbonate solution was added into the reaction tube and mixed. After reaction for 1 h at 25 °C, the absorbance of the reaction solution was measured at 760 nm using a spectrophotometer (Multiskan GO, Thermo Fisher Scientific, Waltham, MA, USA). The results are expressed as mg tannic acid equivalents (TAE) per 100 mL sample using a tannic acid calibration curve.

HASIL DAN PEMBAHASAN

Hasil dan Pembahasan

- Tipe antar jurnal seringkali berbeda
- Ada yang dipisah dan ada yang disatukan
- Umumnya jurnal menggunakan pola terpisah

Hasil dan pembahasan yang disatukan

3. Results and discussion

3.1. Microbiological, physicochemical and microbial properties of the vegetable pickles

The analysis of the microbiological characteristics of the tested pickles showed significant ($P \leq 0.05$) differences between the fresh and canned pickles and among the pickle types (Table 1). With the exception of the mackdo pickles, the aerobic plate count (APC) varied ($P \leq 0.05$) between fresh and canned pickles, suggesting an impact of the pickle conditions on the APC. The highest ($P \leq 0.05$) APC was observed in fresh mixed pickles (2.95 $\log_{10}$ CFU/g) followed by canned cucumber (2.29 $\log_{10}$ CFU/g), while that of other pickles was similar ($P \geq 0.05$) regardless of the treatment conditions. These values were well below the values reported in commercially fermented cucumber pickles brined with 6% NaCl (Pérez-Díaz et al., 2019). It has also been reported that in fresh cucumber and cabbage pickles, the APC may reach 5 $\log_{10}$ CFU/ml (Pérez-Díaz et al., 2015). With few exceptions, APC is not routinely determined in pickles but it may be useful to investigate their spoilage. APC results can also provide useful information regarding food microbiological quality and detect spoilage. It is well known that variations in the microbiological properties of a product greatly influence their chemical properties particularly the pH and acidity (Lennox and Efiuvwevwere, 2013, 2014). The acidity significantly ($P \leq 0.05$) varied between the fresh and canned mackdos pickles, with the highest and lowest values observed in the fresh and canned mackdos pickles, respectively (Table 1). In contrast, the acidity of the mixed and cucumber pickles did not differ under the different treatment conditions. Acetic acid (≥3.6%) is typically applied as an acidulant in non-fermented, acidified vegetable products, thus contributing to the preservation of these products without the use of heat treatments or antimicrobial agents (Bell and Etchells, 1952; Campbell-Platt and Anderson, 1988). For pickled products, acidification with 2% acetic acid to reach pH values of 3.2 prevents the growth of microorganisms for more than 6 months (Fleming et al., 1993).

Hasil dan diskusi terpisah

3. Results

3.1. Yield and chemical composition

The yield of *H. larsenii* essential oil was 11.6 ml/kg of rhizome fresh weight. Table 1 shows the constituents of the essential oil, their percentage composition and their Kovats Index (KI) values listed in order of elution. A total of 24 compounds representing 97.1% of the essential oil were identified. The major constituents of this oil were ar-curcumene (28.6%) and epi-β-bisabolol (10.3%). The chemical structures of three major compounds were shown in Fig. 1. The percentage compositions of remaining 22 compounds ranged from 1.2% to 4.2%.

Table 1
Chemical composition of *Hedychium larsenii* essential oil.

Peak	Components	Retention time (Kovats Index)	Composition (%)	Mode of identification
1	β-Pinene	968	2.8	RI, MS
2	1,8-Cineole	1025	2.4	RI, MS
3	Linalool	1094	1.8	RI, MS
4	Camphor	1135	1.5	RI, MS
5	Terpineol-4	1153	1.2	RI, MS
6	Myrtenol	1187	1.8	RI, MS
7	β-Elemene	1383	2.6	RI, MS
8	β-Caryophyllene	1411	2.4	RI, MS
9	*allo* Aromadendrene	1446	4.1	RI, MS
10	ar-Curcumene	1473	28.6	RI, MS
11	α-Selinene	1482	2.8	RI, MS
12	7 epi-α-Selinene	1503	2.4	RI, MS
13	Nerolidol	1547	3.2	RI, MS
14	Spathulenol	1568	3.5	RI, MS
15	Caryophyllene oxide	1570	4.2	RI, MS
16	Globulol	1581	3.2	RI, MS
17	Viridiflorol	1592	2.7	RI, MS
18	Humulene epoxide	1591	2.3	RI, MS
19	Bisabol-11-ol	1615	3.2	RI, MS
20	τ-Muurolol	1631	2.4	RI, MS
21	α-Cadinol	1642	3.9	RI, MS
22	ar-Turmerone	1650	2.2	RI, MS
23	epi-β-Bisabolol	1662	10.3	RI, MS
24	α-trans-2-Bergamotol	1675	1.6	RI, MS
	Total		**97.1**	

RI Retention index.
MS Mass spectra.

Hasil dan diskusi terpisah

4. Discussion

4.1. Chemical composition of the essential oil

Our study showed that 24 compounds were identified in the *H. larsenii* essential oil. The major constituents were ar-curcumene (28.6%) and epi-β-bisabolol (10.3%). This highlighted a surprising composition, if compared to other essential oils extracted from *Hedychium* species. Indeed, several studies have been conducted on the essential oils from other *Hedychium* species, such as *H. spicatum* (Sabulal et al., 2007), Brazilian *H. coronarium* (Dos Santos et al., 2010), *H. gardenarium* (Weyerstahl et al., 1998), *H. acuminatum* (Weyerstahl et al., 1995), *H. larsenii* (Gopanraj et al., 2005), *H. thyrsiforme, H. elatum, H. bousigoniamum, H. forrestii, H. coccineum, H. flavescens* (Sakhanokho et al., 2013), and *H. stenopetalum*, Vietnamese *H. coronarium, H. flavum, H. ellipticum* (Thanh et al., 2014). As a general trend, they were characterized by the abundance of monoterpenoids, with major percentage of 1,8-cineole and pinene derivatives. For instance, the essential oil of *H. coronanium* leaves was mainly composed by β-pinene (Randiamiharisoa, 1996), whereas the essential oil extracted from the flowers contained β-ocimene and linalool as the major constituents (Báez et al., 2011). Similarly, the leaf and flower essential oils of *H. gardenarium* were mainly composed by α-and β-pinene (Medeiros et al., 2003), while 1,8-cineole and linalool were the major constituents of the essential oils extracted from petals and flower stalks of *Hedychium flavum* from South China (Dan et al., 1999). The major essential oil components of *Hedychium coccineum* from Mauritius were (*E*)-nerolidol (44.4%) and trans-sesquisabinene hydrate (24.2%) (Gurib-Fakim et al., 2002).

kesimpulan

5. Conclusions

Overall, the present research sheds light on the chemical composition of the essential oil of *H. larsenii* as well as on the larvicidal and oviposition deterrent activity of its two major constituents ar-curcumene and epi-β-bisabolol against the malaria vector *A. stephensi*, the dengue and Zika virus vector *A. aegypti* and the filariasis and St. Louis encephalitis vector *C. quinquefasciatus*. Since the acute toxicity of ar-curcumene and epi-β-bisabolol on the larvivorous fish *P. reticulata* was extremely low, with $LC_{50} > 1500$ ppm, we believe that the two molecules identified in this study from the *H. larsenii* EO can be considered for the development of effective and mosquito larvicides.