Leaflet No.18/2017

The Republic of the Union of Myanmar
Ministry of Natural Resources and Environmental Conservation
Forest Department

Investigation of Most Active Chemical Constituent in Kanzaw Seed oils (*Madhuca lonigfolia* and *Payena parallelloneura* Kurz.)

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December, 2017

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ကမ်းဇော်ဆီ(ရေကမ်းဇော်ဆီနှင့် ကုန်းကမ်းဇော်ဆီ)တို့တွင် ပါဝင်သော စွမ်းဆောင်ရည်အရှိဆုံး ဓါတုပါဝင်ပစ္စည်းကို စူးစမ်းလေ့လာခြင်း

စုမြင့်သန်း၊ သုတေသနလက်ထောက် - ၂

သီတာချို၊ သုတေသနလက်ထောက် - ၂

အကျဉ်းချုပ်

မြန်မာနိုင်ငံတွင် ကမ်းဇော်ပင်ဟုသာ သိကြပါသည်။ ၎င်း၏မျိုးရင်းမှာ Sapotaceae ဖြစ်ပါသည်။ ကမ်းဇော်ပင်သည် မြန်မာနိုင်ငံတောင်ပိုင်းဘက်ဖျား တနင်္သာရီတိုင်းအတွင်း အခြားသစ်ပင်ကြီးများနှင့် ရောနှောပေါက်ရောက်သည်။ ကမ်းဇော်ပင်သည် အမျိုးအစား (၂) မျိုးရှိပါသည်။ ၎င်းတို့မှာ ရေကမ်းဇော်နှင့် ကုန်းကမ်းဇော်တို့ ဖြစ်ပါသည်။

ကမ်းဇော်ဆီကို ဒေသခံဆေးဝါးအဖြစ် ဝမ်းတွင်ဖြစ်တတ်သော ရောဂါများ၊ အပူအကြိတ်များ၊ ချောင်းဆိုးသွေးပါ ရောဂါများ၊ ပန်းနာ ရင်ကြပ်ရောဂါ၊ မီးယပ်ရောဂါအမျိုးမျိုး၊ ရေနွေးလောင် မီးလောင် ထိခိုက်နာ အမျိုးမျိုး၊ ဒူလာရောဂါ၊ လိပ်ခေါင်းရောဂါ၊ စအိုကွဲနာ၊ ခြေကွဲနာ၊ အကြောရောဂါ၊ အဆစ်အမြစ် ကိုက်ခဲ ရောင်းရမ်းခြင်းတို့တွင် အသုံးပြုပါသည်။

ရေကမ်းဇော်သီးများကို **ပုလောမြို့နယ်၊ သာယာကုန်းကျေးရွာမှ လည်းကောင်း၊ ကုန်းကမ်းဇော်ကို ရေဖြူမြို့နယ်၊ ကလုံးထာကျေးရွာမှ လည်းကောင်း စုဆောင်းခဲ့ပါသည်။ အီသနောဖြင့် ထုတ်ယူ ရရှိလာသောဆီ(၂)မျိုးနှင့် ဒေသခံနည်းဖြင့် ထုတ်ယူ ရရှိသောဆီ(၁)မျိုး စုစုပေါင်းဆီ(၃)မျိုးတို့ကို ဇီဝအကျိုးပြု ဓါတုဒြပ်ပေါင်းများစမ်းသပ်ခြင်းနှင့်** quercetin ဒြပ်ပေါင်း ပါဝင်မှုကို Thin Layer Chromatography (TLC)**နှင့်** FT-IR spectra စက်ဖြင့်လည်းကောင်း စမ်းသပ်ခြင်းတို့ ဆောင်ရွက်ခဲ့ပါသည်။ စမ်းသပ်တွေ့ရှိချက်အရ ဆီ(၃)မျိုးတို့တွင် ဇီဝအကျိုးပြု ဓါတုဒြပ်ပေါင်းများဖြစ်သော flavonoids, alkaloids, terpenoids, phenolic compounds and carbohydrate တို့ပါဝင်ပါသည်။ ထိုကြောင့် ဆေးဝါးပစ္စည်းအဖြစ် အသုံးပြုနိုင်ပါသည်။ Thin Layer Chromatography (TLC)**နှင့်** FT-IR spectra စက်တို့ဖြင့် စမ်းသပ်ချက်အရ quercetinနှင့် mytricetineဒြပ်ပေါင်းပါဝင်ကြောင်းတွေ့ရှိရပါသဖြင့် antibacterial, anticancer, hepatoprotective, antiulcer, antihyperglycemic တို့ကိုလည်း ပျောက်ကင်းစေနိုင်ပါသည်။ ကမ်းဇော်သီး၏ ဆေးဘက်ဝင်မှုကို ဒေသခံကျေးလက်နေ ပြည်သူလူထုသာမက ဖွံ့ဖြိုးနေသော နိုင်ငံများအထိ ခေတ်မီဆန်းသစ်သော ဆေးဝါးကောင်း တစ်လက်ဖြစ်ပါသည်။

Investigation of Most Active Chemical Constituent in Kanzaw Seed oils

(*Madhuca lonigfolia* and *Payena parallelloneura* Kurz.)

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Abstract

In Myanmar, "Kanzaw" is Myanmar name and it belongs to the Sapotaceae family. They are two types of Kanzaw: Ye-Kanzaw (*Madhuca lonigfolia*) and Kon-Kanzaw (*Payena parallelloneura* Kurz.). It is commonly found in the Taninthayi region of the southern Myanmar.

Nowadays, its oil is widely used in the traditional system of medicine for anticancer throughout the Myanmar. But, the quercetine and myricetine content in Kanzaw seed oil has not been reported in the literature. Thus, an attempt was made to isolate and quantify quercetin and myricetin in Kanzaw seed oils (Ye-Kanzaw and Kon-Kanzaw) with the help of phytochemistry, FT-IR spectroscopy and chromatographic fingerprints in the present work.

Sample seeds of Ye-Kanzaw were collected from ThaYaKon Village, PeLaw Township and sample seeds of Kon-Kanzaw were collected from KaLoneHta Village, YePhyu Township, TaNinThaYi Region.

Three crude seed oil extracts of Kanzaw were subjected to preliminary phytochemical investigation for the presence of various active constituents. The result indicated that the abundant compounds in three extracts were flavonoids and alkaloids Tannins are absent in three extracts. Aqueous fractions of the concentrated crude oil extracts fraction was checked by Thin Layer Chromatography (TLC). And accordance with the FT-IR spectra, the functional groups in the isolated compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYK) resemble those of quercetin. Hence, the isolated compounds Kon-Kanzaw Compound(KC) could be assigned as myricetine. A lot of therapeutic research was carried out on Kanzaw oil which shows its ethnomedical properties like antibacterial, anticancer, hepatoprotective, antiulcer, antihyperglycemic activities etc. These plants are

effective source of both traditional and modern medicines and are genuinely useful for primary healthcare.

Investigation of Most Active Chemical Constituent in Kanzaw Seed oils

(*Madhuca lonigfolia* and *Payena parallelloneura* Kurz.)

1. Introduction

In Myanmar**,** "Kanzaw" is yanmar name and it belongs to the Sapotaceae family. Kanzaw tree was divided into two species: Ye-Kanzaw (*Madhuca lonigfolia)* and Kon-Kanzaw *(Payena parallelloneura* Kurz). They are commonly found in the Taninthayi region of the southern Myanmar. Ye-Kanzaw is naturally grown in swamp Forest of Pelaw Township, Kyunsu Township, BoadPyin Township and Taninthayi Township while Kon-Kanzaw is naturally grown on the hill Forest of Dawei Township.

In traditional medicine, Kanzaw seed oil has been widely used in cough, asthma, bronchitis, colic, and gastritis at a dose of one tea spoon with honey three times per day, in various injuries such as bed sore, gout and inflammation at 5 or 10times smear per day, in ulcerogenic at a dose of one tea spoon two times per day (Daw Wa Wa, Myanmar Medicine).

The seeds of this plant exhibit significant pharmacological properties. Nowadays, its oil is widely used in the traditional system of medicine for anticancer throughout the Myanmar. But, the quercetine and myricetine content in Kanzaw seed oil has not been reported in the literature. Thus, an attempt was made to isolate and quantify quercetin and myricetin in Kanzaw seed oils of Ye-Kanzaw, Traditional Ye-Kanzaw and Kon-Kanzaw with the help of phytochemistry, FT-IR spectroscopy and chromatographic fingerprints in the present work.

Although Myanmar is endowed with a rich heritage of medicinal plants, medicinal uses of Kanzaw plant are little known. Presently, the Republic of the Union of Myanmar pays serious attention on promotion of Myanmar traditional medicine sector. Thus, to promote its medicinal uses the bioactive ingredients and their ability to treat various diseases in the kanzaw plant material should be investigated.

Therefore, this study was conducted to identify and isolate the active chemical principles in the seed oil extracts of Kanzaw, which may provide validation for some of its reported pharmacological activities.

2. Literature Review

Mahua is a common name used for *Madhuca longifolia*, it belongs to the family Sapotaceae. It is an important economic tree growing throughout India. Mahua is a highly nutritious tree and can also use as an herbal medicine for treatment of various disease. Phytochemistry (Sinha J,et al 2017) study of mahua shows that it is rich in sugar, vitamin, protein, alkaloids, phenolic compounds etc. A lot of

therapeutic research was carried out on mahua which shows its ethnomedical properties like antibacterial, anticancer, hepatoprotective, antiulcer, antihyperglycemic, analgesic activities etc. Mahua flower is not only used in preparation of liquor but can also utilized as a food ingredient for preparation of biscuit, cake, laddu, candy, bar, jam jelly, sauces etc (Sinha J,et al 2017). This review paper focusing on employment and income generation through commercial use of mahua flower, fruit and seed in medicine and food industry.

The species is distributed in northern, central and southern part of peninsular India, Sri Lanka and Burma. Southern India extending northwards to Maharashtra and Gujarat. *Madhuca longifolia* is found in some parts of central and north India and Burma. It is common in dry mixed deciduous forests, dry forest and dry teak forests. The tree grows on a wide variety of soils but thrives best on sandy soil. It also grows on shallow, boulder, clayey and calcareous soils. It is found up to an altitude of 1200 m, mean annual maximum temperature 28-50°C, minimum 2-12°C; annual rainfall from 550-1500 mm. The species is drought-resistant, strong light demander and readily suppressed under shade. It is not frost-hardy (Jyoti Sinha, et al (2017)).

Phytochemistry has undergone significant development in recent years as a distinct discipline. It is concerned with enormous variety of compounds that are synthesized and accumulated by plants and also deals with the structural characterization of these molecules. Flower, Vitamins A and C. Fruits, α- and β-amyrin acetates. Seeds, Arachidic, linolelic, oleic, myrisic, palmitic and stearic acids, α-alanine, aspartic acid, cystine, glycine, isoleucine and leucine, lysine, methionine, proline, serine, threonine, myricetin, quercetin, Misaponin A and B. Fat obtained from mahua seeds has many medicinal applications. The seeds fat has emuluscent property, used in skin disease, rheumatism, headache, laxative, piles and sometimes as galactogogue. Also used as laxative in habitual constipation and piles, gummy juice applied in rheumatism and skin affection, oil used in skin disease (Jyoti Sinha, et al (2017)).

Heath benefits of Mahua seed

Anti-inflammatory activity: Ramchandra et al (2009). evaluated the ethanol extract and saponin mixture of seeds of *Madhuca longifolia* for anti-inflammatory activity using acute (carrageenan-induced inflammation), sub-acute (formaldehyde-induced inflammation), and chronic (cotton pellet granuloma) models of inflammation in rats. The ethanol extract and saponin mixture at a dose level of 10 and 15 mg/ kg and 1.5 and 3 mg/kg significantly reduced the edema induced by carrageenan in acute model of inflammation, inhibiting both phases of inflammation. Both the extracts had a more effective response than the reference drug diclofenac sodium in the sub-acute inflammation model. Results longifoliated a significant anti-inflammatory activity by *Madhuca longifolia* saponins in cotton pellet granuloma.

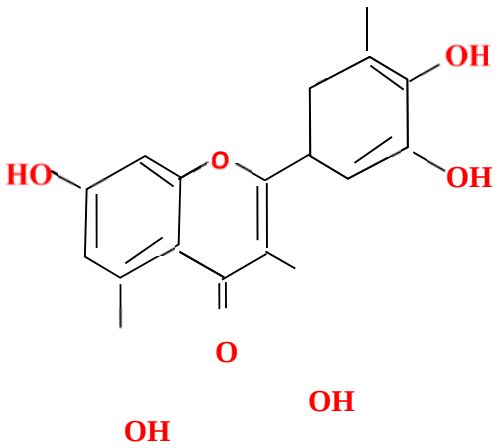
Anti-hyperglycemic activity: The ethanolic extract of seeds of *Madhuca longifolia*was effective in reducing the plasma glucose level in normal albino rats in a dose dependent

manner, producing hypoglycemic effect by stimulating the release of insulin from the β-cells and or increasing the uptake of glucose from the plasma.

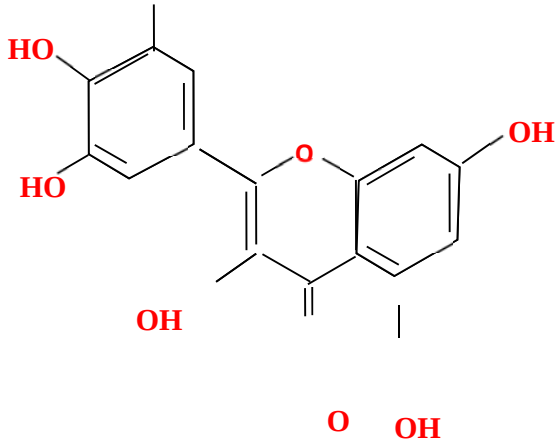
Antiulcer activity: The crude alkaloid extract and ethanolic extract of seeds of *Madhuca longifolia* were evaluated for anti-ulcer activity. The result shows that ethanolic extract was significantly effective in protecting pylorus ligation-induced gastric ulcers. The ethanolic extract at a dose level of 10 mg/kg showed a significant decrease in the ulcer index compared to vehicle, and was near to that of lansoprazole used at a dose level of 40 mg/kg, while crude alkaloid extract exhibited no significant gastroprotective effect.

Anticancer activity: Bhaumik et al. studied the in-vitro anticancer activity of different extract of fruit seed of *Madhuca longifolia* against human cancer cell line (HeLa) and used MTT assay to analyze the cell growth inhibition. Results showed that the various extracts of fruit-seeds of *Madhuca longifolia* have a very good to moderate anticancer activity.

Flavonoids is known as 'Vitamin-P'. They are considered as active principles of any medicinal plants. Quercetin is a natural flavonoid (phenolic compound) that is found in many seeds. Quercetin is thought to have potent antioxidant, antidiabetic and anti tumour, and antiviral, anti-inflammatory benefits (British Journal of Nutrition.2008). Quercetin is one of the sub-classes of flavonoids and more specifically a flavonol. it is plant derived flavonoid used as a nutritional supplement found in fruits and vegetables. It is known for its ability to relieve fever, sinusitis and asthma. Also inhibit both tumor promoters and human cancer cells. The presence of oxy and hydroxyl groups as well as double bonds in specific positions make them strong antioxidants(J.B. Harbone,1993, Merck Index, 10th Edition, Merck & Co. Inc., USA. 1983).



Structure of Flavonoid Quercetin
Molecular Formula: $C_{15}H_{10}O_7$



Structure of Flavonoid Myricetin
Molecular Formula: $C_{15}H_{10}O_8$

Myricetin is a naturally- occurring flavonoid found in many fruits, vegetables, herbs, as well as other plants. A yellow crystalline compound with a melting point of 357 ˚C; soluble in alcohol; used as an inhibitor of adenosine triphosphatase. Myricetine has antioxidant properties. In vitro research suggests that myricetine in high concentration can modify

cholesterol such that uptake by white blood cells is increased. A finish study correlated high myricetine consumption with loweredrates of prostate cancer (Knekt, 2002). Myricetine has shown anti-inflammatory, anti-hyperglycemic, anti-tumor, anti-viral and anti-baterial activity.(E.Middleton, et al, 2000)

3. Objectives

1. To investigate the most active chemical composition of Kanzaw seed oils of Ye-Kanzaw and Kon-Kanzaw.
2. To recommend the suitable uses of their most active composition.

4. Materials and Methods

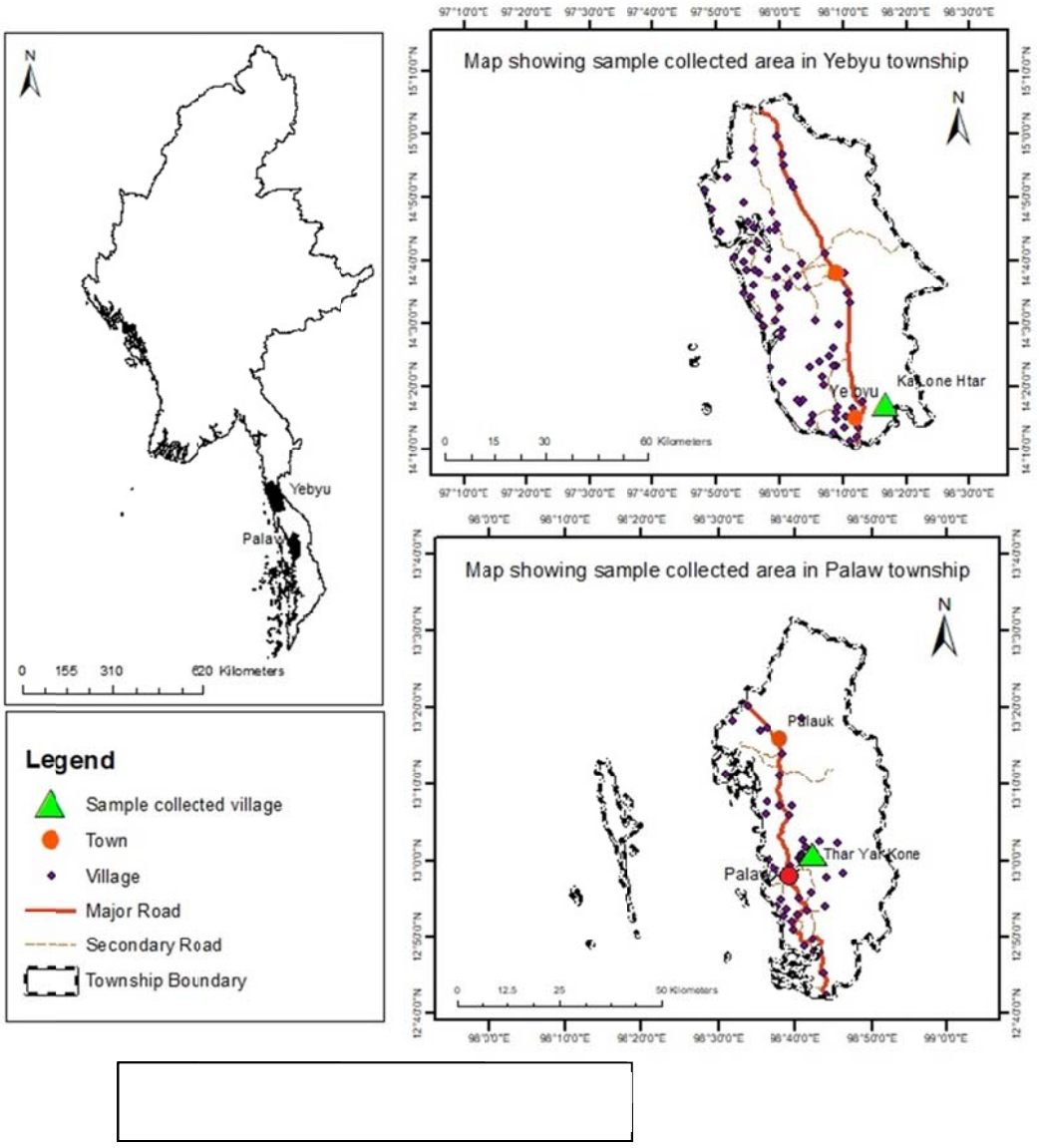
4.1 Plant material

Sample seeds of Ye-Kanzaw were collected from Thar-Yar-Kone village, Pelaw Township and Kon-Kanzaw were collected from Ka-Lone-Htar village, Yephyu Township. Fresh samples of seeds were collected in the month of May and June, 2015. Sample seeds of Kanzaw were air dried in shade at room temperature. When the dried, seeds were pasted.

Fig2. Ye-Kanzaw Leave and seeds

Fig3.Ye-Kanzaw Bark (Right)
Kon-Kanzaw Bark (Left)

Fig5. Kon-Kanzaw Leave and seeds



4.2 Preparation of extracts

Each of 50gms seed paste were placed in the glass Soxhlet thimbles and extracted with ethanol for 16 hours. The crude oil extracts were stored in the refrigerator at 4°C for further use. And traditional oil was extracted by traditional distillation method.

4.3 Preliminary Phytochemical Screening

Three crude oil extracts of Kanzaw seed were subjected to preliminary phytochemical investigation for the presence of various active constituents. The chemical constituents of the extracts were identified by test tube methods.

4.4 Column Chromatography

Aqueous fractions of the concentrated crude oil extracts were separated by wet column chromatography packed with silica gel. n-hexane: ethylacetate in various ratios was used as the mobile phase. About 3ml of each fraction was collected in small bottle by using eluting solvents. 123 and 135 fractions were collected from seed oil extracts. Then each fraction was checked by Thin Layer Chromatography (TLC).

Traditional

4.5 Thin Layer Chromatography (TLC)

TLC separation was carried out using silica coated plates. After checking the fractions that obtained from column chromatographic separation by using TLC, the fractions that showed the same R_f values were combined. Two combined fractions (II) and (V) of seed oil extract of Ye- Kanzaw, Traditional Ye-Kanzaw and five combined fractions (VII), (VIII), (IX),(XI) and (XIV) of the seed oil extract of Kon-Kanzaw show one spot on TLC plate. These fractions gave various crystals on crystallization by cooling in the refrigerator.

4.6 Purification of combined fractions obtained by column separation

The resulting combined fractions may not quite pure. They were purified by recrystallization. On purification, two combined fractions of the seed extract of YC and TYC gave colorless crystals especially the fraction (II) gave needle-shaped colorless crystal. Also five combined fractions of the seed extracts gave pure crystals especially the fraction (XIV) gave yellow colored crystals. These fractions (II) and (XIV) were labeled as Compound (YK), (TYK) and Compound (KC) respectively.

FT-IR Spectroscopic determination The FT-IR Spectra of the isolated compounds, Compound (C) and Compound (C) were measured at the Department of Chemistry, University of Mandalay.

5.Results and Discussion

5.1 Preliminary Phytochemical Screening

Table1. Phytochemical screening of seed oil extracts of Kanzaw

Test	Test Reagent	Observation	Results		
			Ye-Kanzaw by Soxhlet extraction	Kon-Kanzaw by Soxhlet extraction	Ye-Kanzaw by Traditional method
Flavonoid	Conc HCl + Mg turnings	Pink Color	+	+	+
Alkaloid	Mayer's reagents	White ppt	+	+	+
Phenolic compound	1% $K_3Fe(CN)_6$ +1% $FeCl_3$ sol	Blue color	+	+	+
Glycoside	10% NaOH sol	Yellow ppt	+	+	+
Terpene	$(CH_3CO)_2O$ + $CHCl_3$+ H_2SO_4	green Color	+	+	+
Saponin	Shake Vigorously	Foam	+	+	+
Tannin	2% NaCl + 1% $FeCl_3$	No bluish green ppt	-	-	-

From the above table, the positive signs indicated the intensity of reactions that reflects the quantity present. The result indicated that the abundant compounds in the extracts were flavonoids and alkaloids. The presence of saponin, glycosides, terpenoids and phenolic compounds were also observed in three extracts. Tannin is absent in three extracts.

5.2 Purification of combined fractions obtained by column separation

After purification, the phytochemical tests for Ye-Kanzaw Compound (YC), Traditional Ye-Kanzaw Compound (TYC)and Kon-Kanzaw Compound (KC) were carried out again. The results were shown in the following table(2). This indicated that Ye-Kanzaw Compound (YC), Traditional Ye-Kanzaw Compound (TYC)and Kon-Kanzaw Compound (KC) would be flavonoids.

Table2- Phytochemical tests for Ye-Kanzaw Compound (YC), Traditional Ye-Kanzaw Compound (TYC)and Kon-Kanzaw Compound (KC)

Compounds	Test	Extract	Test Reagent	Observation	Result
YC	Flavonoid	95%EtOH	ConcHCl + Mg turnings	Pink Color	+
TYC	Flavonoid	95%EtOH	ConcHCl + Mg turnings	Pink Color	+
KC	Flavonoid	95%EtOH	ConcHCl + Mg turnings	Pink Color	+

YC = Ye-Kanzaw Compound TYC = Traditional Ye-Kanzaw Compound KC = Kon-Kanzaw Compound

5.3 Melting points Determination

The observed melting points of the isolated compound, YC and TYC were found to be (126˚C and 125˚C). These values are in good agreement with the literature value of quercetine (m.p= 123-125˚C).

The observed melting points of the isolated compound, KC was found to be 355-358˚C. This value is in good agreement with the literature value of myricetine (m.p= 357˚C).

5.4 Spectroscopic Examination

5.4.1 Identification of Compounds YC, TYC and KC by FT-IR Spectroscopic Method

The FT-IR spectra of compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYC) are shown in Fig (11), (12) and (13) .In these spectra, the bands at 3342 cm^{-1} and 3332.8 cm^{-1} indicate the stretching vibration of (-OH) group. The intense bands at 1650 cm^{-1} indicate>C=O stretching vibration band of carbonyl group.

The bands which appear at 1604 and 1504 cm^{-1} imply >C=C< stretching vibration of aromatic benzene ring. The sharp bands, which appears at 1367 cm^{-1} indicate, (-OH) in plane bending vibration of phenolic group.

The bands which appear at 1272 and 1049 cm^{-1} indicate C-O-C stretching vibration of ether group. In addition, the bands at 1195 cm^{-1} are due to the –OH bending vibration of alcohol. =C-H bending vibration of trans- alkene observed at 948 cm^{-1}. The bands which appear at 825 cm^{-1} indicate the presence of =C-H bending vibration of cis- alkene.

The FT-IR spectra of compounds Kon-Kanzaw Compound (KC) is shown in Fig (11).In these spectra, the bands at 3456 cm^{-1} and 3193 cm^{-1} indicate the stretching vibration of (-OH) group. The intense bands at 1658 cm^{-1} indicate>C=O stretching vibration band of carbonyl group.

The bands which appear at 1604 and 1496 cm^{-1} imply >C=C< stretching vibration of aromatic benzene ring. The sharp bands, which appears at 1365 cm^{-1} indicate, (-OH) in plane bending vibration of phenolic group.

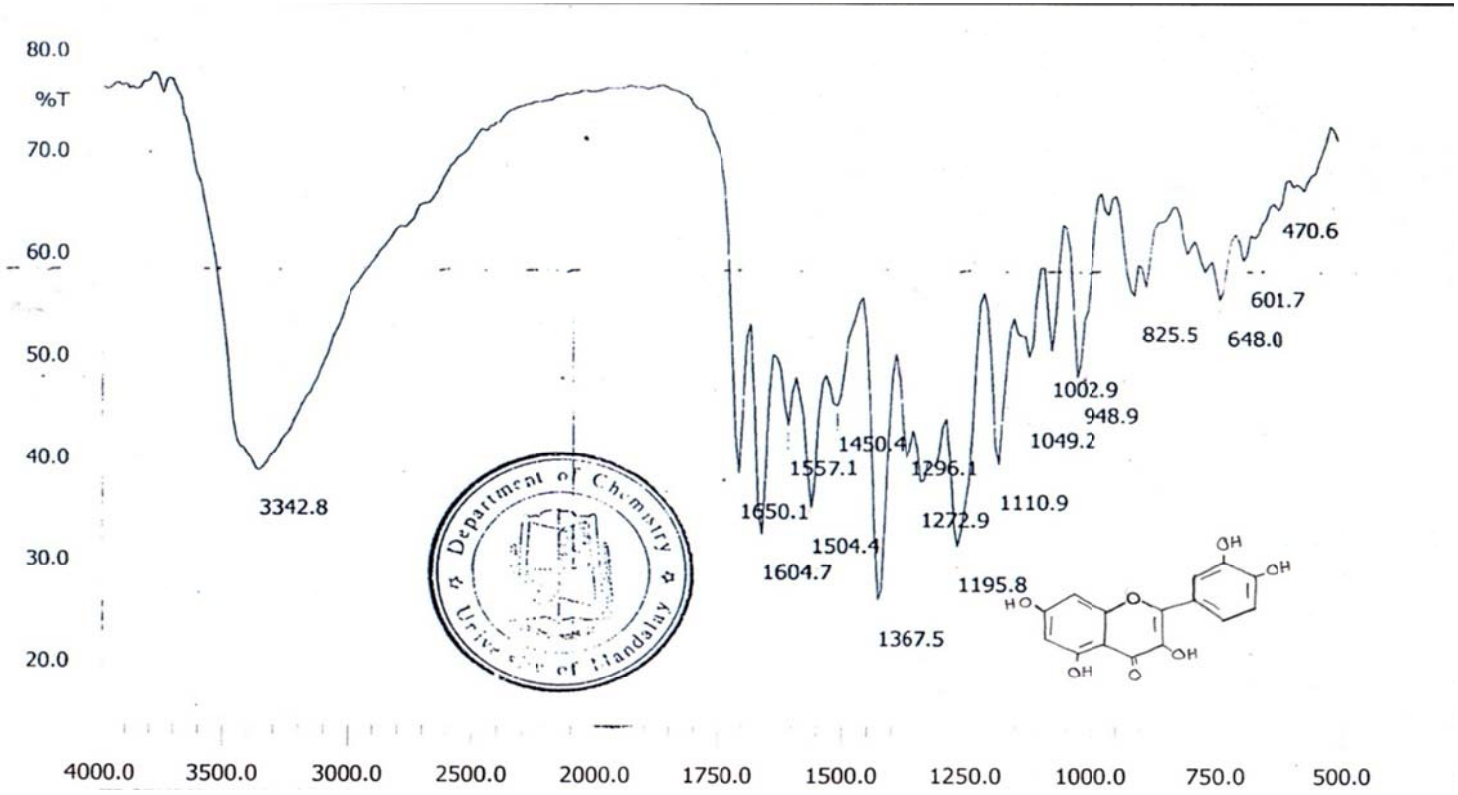
The bands which appear at 1265, 1134 and 1087cm^{-1} indicate C-O-C stretching vibration of ether group. In addition, the bands at 1180 cm^{-1} are due to the –OH bending vibration of alcohol. =C-

H bending vibration of trans- alkene observed at 810 and 786 cm^{-1}. The bands which appear at 702 cm^{-1} indicate the presence of C =C-H out of plane bending vibration of aromatic benzene ring.

Hence, the FT-IR spectra represent the existence of the following functional groups.

- Phenolic (-OH) group
- Aromatic ring group
- Carbonyl group
- Ether functional group respectively.

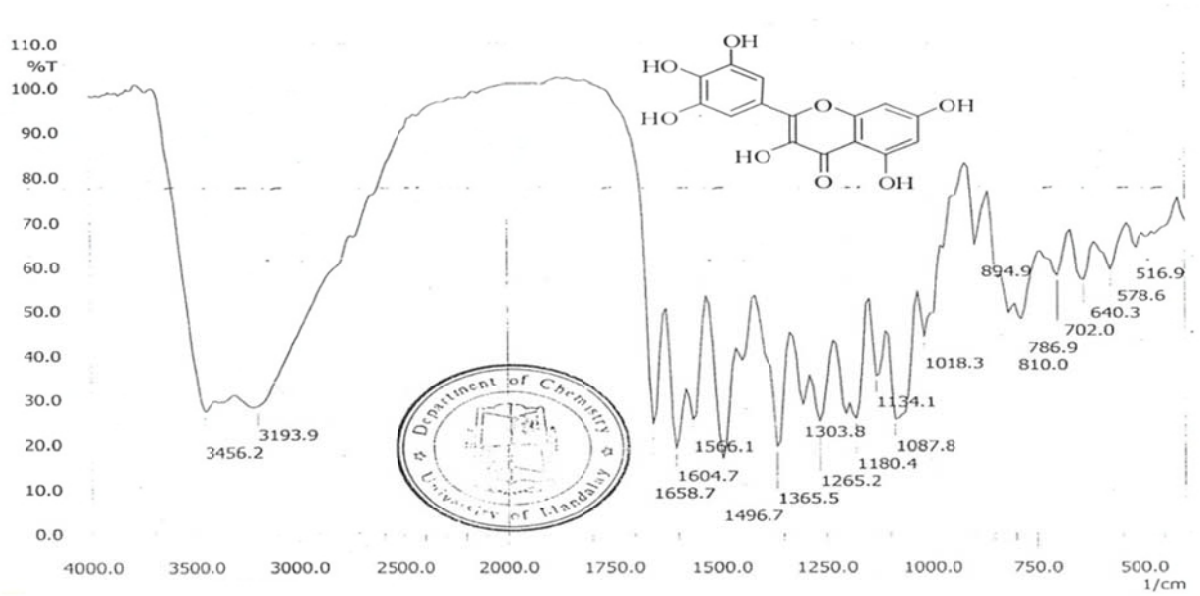
In accordance with the above spectral data, nearly all functional groups are identical with the quercetin and mtricetine. Although the FT-IR spectra of compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYC) could not be identified by that of an authentic quercetin, the functional groups in the isolated compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYC) resemble those of quercetin. Hence, the isolated compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound(TYC) assigned as quercetin. And Kon-Kanzaw Compound (KC) could not be identified by that of an authentic myricetin, the functional groups in the isolated compounds Kon-Kanzaw Compound (KC) resemble those of myricetin. Hence, the isolated compounds Kon-Kanzaw Compound (KC) assignedasmyricetin.



YC(II)MT:YC (II) MT Date: 03/11/2017 Time:11:12:10 NScans:45

Type:	HYPER IR	User:	SHIMADZU	Detector:	standard
Abscissa:	1/cm	Ordinate:	%T	Apodization:	Happ
Min:	401.17	Max:	3996.23	Range:	1/cm
Ndp:	933	Data Interval:	3.85737	Resolution:	8.0
Gain:	auto	Aperture:	auto	Mirror Speed:	2.8(low)

Fig 11. Characteristic Absorption Bands in FT-IR Spectrum of YC



KC (XIV) MT: KC (XIV) MTL Date: 04/11/2017 Time: 11:00:15 NScans:45

Type:	HYPER IR	User:	SHIMADZU	Detector:	standard
Abscissa:	1/cm	Ordinate:	%T	Apodization:	Happ
Min:	401.17	Max:	3996.23	Range:	1/cm
Ndp:	933	Data Interval:	3.85737	Resolution:	8.0
Gain:	auto	Aperture:	auto	Mirror Speed:	2.8(low)

Fig 12. Characteristic Absorption Bands in FT-IR Spectrum of KC

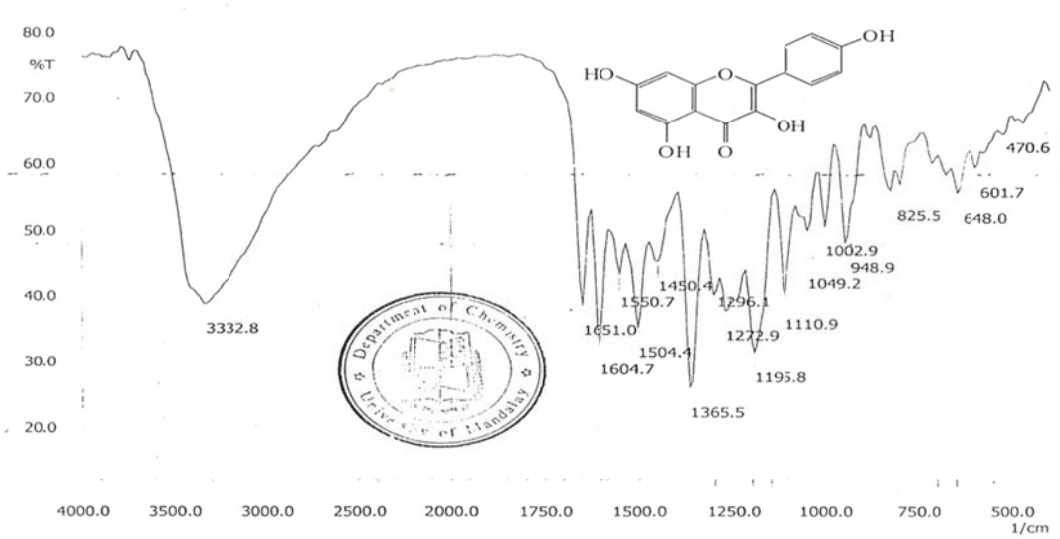


Fig 13. Characteristic Absorption Bands in FT-IR Spectrum of TYC

TYC (II) MT: TYC (II) MT Date: 03/11/2017 Time: 12:10:30 NScans:45

Type:	HYPER IR	User:	SHIMADZU	Detector:	standard
Abscissa:	1/cm	Ordinate:	%T	Apodization:	Happ
Min:	401.17	Max:	3996.23	Range:	1/cm
Ndp:	933	Data Interval:	3.85737	Resolution	8.0
Gain:	auto	Aperture:	auto	Mirror Speed:	2.8(low)

Conclusion

From the preliminary phytochemical tests it has been observed that the chemical constituents of the Kanzaw seed oils contain flavonoid, followed by alkaloids, saponin, glycosides, terpenoids and phenolic compounds respectively. Most of the constituents are very useful as drugs.

In this research work, the preliminary investigations of the Kanzaw seed oils of Ye-Kanzaw, Traditional Ye- Kanzaw and Kon-Kanzaw have been done. The antimicrobial and anticancer activities of the crude extract in various by systems have been examined by agar well diffusion method on the selected organisms. Isolation of quercetine and myricetine compound from EtOH extract of the sample has been made. Then, the extracts were confirmed by using silica gel column chromatography, thin layer chromatography, FT-IR spectroscopy and high performance liquid chromatographic analysis.

From the study of the results of phytochemical examination, melting point determination, compound YC, TYC must be quercetine and compound KC must be myricetine. Although the FT-IR spectra of compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYC) could not be identified by that of an authentic quercetin, the functional groups in the isolated compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYC) resemble those of quercetin. Hence, the isolated compounds Ye-Kanzaw Compound (YC) and Traditional Ye-Kanzaw Compound (TYC) assigned as quercetin. And Kon-Kanzaw Compound (KC) could not be identified by that of an authentic myricetin, the functional groups in the isolated compounds Kon-Kanzaw Compound (KC) resemble those of myricetin. Hence, the isolated compounds Kon-Kanzaw Compound (KC) assigned as myricetin.

In conclusion, the potent source of novel bioactive compounds with wide range of medicinal properties. A lot of therapeutic research was carried out on Kanzaw oil which shows its ethnomedical properties like antibacterial, anticancer, hepatoprotective, antiulcer, antihyperglycemic activities etc. The seed oil extracts should be investigated the fatty acid (saturated and unsaturated) because of use as medicine.

This review paper focus on employment and income generation through commercial use of mahua flower, fruit and seed in medicine and food industry.

Thus, the scientific research on Kanzaw suggested biological active properties of the extracts might provide detailed evidence for the use of this plant should be protected and estalblished the plantations. These are not only used for primary healthcare in rural areas in developing countries, but also in developed countries as well where modern medicines are

predominantly available. The use of plants as a source of medicine has been inherited and is an important component of the health care system in Myanmar and abroad even in the present. These plants are effective source of both traditional and modern medicines and are genuinely useful for primary healthcare.

Acknowledgement

I would like to express my sincere thanks to U Soe Tint, Deputy Director for supporting the car during the sample collection. I am also pleased to express special thanks to U Aung Zaw Moe, Research Officer for his invaluable species identification. I would like to thank Daw Su Mon San , Range Officer for her drawing of the map.

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