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Preliminary Study: Application of Spot-mapping Technique for Estimating the Size of Oriental Magpie Robin *Cospychus saularis* (Aves: Muscicapidae) Territories in Universiti Malaysia Sarawak (UNIMAS)

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ABSTRACT

Breeding territoriality plays a role in determining the reproduction outcome of many passerines species. The spot-mapping was used to estimate the breeding territory size of a territorial male of Oriental Magpie robin (*Cospychus saularis*) at Dahlia College, Universiti Malaysia Sarawak which is located within Kota Samarahan. It was conducted by mapping the song perching locations established by a marked male. The breeding territory size of the male was estimated to be 0.78 hectares. The data analysis was done using Minimum Convex Polygon (MCP) which was constructed by using Google Earth Pro software. Study on breeding territory size of this bird species is crucial to understand more regarding the breeding behaviour of this species. Data on the behavior of this species could be used for future studies of this bird in Borneo.

Keywords: Oriental Magpie Robin, breeding territory size, spot-mapping, Minimum Convex Polygon

INTRODUCTION

The Oriental Magpie robin (*Copsychus saularis*) is a passerine bird from family Muscicapidae (Myers, 2009). It is a common species in Malaysia Borneo (Phillipps, 2011). It is widely distributed in Indian Subcontinent, S. China, SE Asia, Sumatra, Java, Bali and Philippines, excluding Palawan (Lim *et al*., 2010; Myers, 2009). Morphologically, this open-area species can be characterised by its possession of prominent black and white plumage colours; black bill, grey legs, and has a long tail. Both male and female has similar morphological features, but they can easily be identified by its differences in their plumage colours. The male has black upper parts and throat, white under parts and side of the tail (Figure 1); while for the female, the black colour of male is replaced with grey colour (Figure 2). There are three sub-species recorded in Borneo, which are *C. s. musicus, C. s. adamsi*, and *C. s. pluto*. This species can be found in cultivated areas, woodland, and areas close to human settlements (Koli, 2014). Their foods consist of invertebrates like cockroaches, dragonflies, and praying mantis larvae and small vertebrates like house geckos (Sreekar, 2010).

C. saularis is a secondary cavity nester; which both male and female build up their nests in natural cavities like tree holes and artificial cavities like nest boxes or any holes in a building (Singh, Bhatt, Sethi & Dadwal, 2016). Being classified as a territorial species, the male of *C. saularis* utters its territorial song to establish their own territory and attract females during mating season (Bhatt, Kumar, Singh & Payne, 2000; Catchpole & Slater, 2008; Wanniarachchi & Wijesundara, 2016). It also maintains its own territory, which is known as territoriality. This act will occur when the male individual acts defensively toward any intruders within a specific area of which it fully uses its territorial area for nesting activities, obtaining food resources, and mating (Brown, 1964; Odum & Kuenzler, 1955). The territorial area might consist of a part or entire space used by the male individual to carry out its daily activities during mating and breeding season (Catchpole & Slater, 2008; Wanniarachchi & Wijesundara, 2016).

This study focuses on estimating the territorial size of a male *C. saularis* as well as collecting data on one pair daily activities during their breeding season for future researches. Based on the previous studies, the Magpie robins are constantly threatened by both intraspecific as well as introduced species like Asian Glossy starling (*Aplonis panayensis*) and Common Myna (*Acridotheres tristis*) (Singh *et al.,* 2016). In addition, the scarcity of tree cavities caused by habitat degradation and urbanization has induced the fights for nesting sites between those three species, which the introduced species are more dominant compared to *C. saularis* (Bhatt, Sethi, Kumar & Singh, 2014).

Figure 1. A male of *C. saularis* was found hoping on the ground. *Photo credit:* Jason (2018).

Figure 2. A female of *C. saularis* was found perching on a branch of tree. *Photo credit:* Jason (2018).

MATERIAL & METHODS

Study Sites

The study site was located at Dahlia College, Universiti Malaysia Sarawak (1° 27' 34" N, 110° 29' 56" E) within Kota Samarahan Division (Figure 3). The selection of this site is due to easy accessibility and the college itself is near to UNIMAS Sarawak Golf Club boundaries which were planted with many trees.

Bird Trapping and Spot-Mapping

A male *C. saularis* was captured by using mist nets. The bird was found nested in a cavity of Pulai tree species (*Alstonia angustiloba*) (Figure 4). Playback songs were used to attract this male bird (Najmi-Hanis, Puan, Zakaria & Azhar, 2016). Once captured, the male was then marked with a unique combination of two colours plastic, leg bands for individual recognition. After the banded bird was released back to its habitat, the behaviour of the marked male bird was observed for approximately 10 – 20 minutes. If the bird constantly picked the bands with its mouth after the 20 minutes, the bands would be removed.

Figure 3. The map shows the location of studied area which is Dahlia College, UNIMAS by using Google Earth Pro software.

Figure 4. The bird was found nested in the hole (yellow arrow) of Pulai tree (*Alstonia angustiloba*). *Photo credit:* Kathleen (2018).

It is known that the breeding season of this species in UNIMAS begins at the end of December until mid-September (personal communication). However, due to time constraint, the spot-mapping was conducted from March 17 to April 15, 2018 which were still within the species breeding period. The spot-mapping can be used to calculate the song territory size of a passerine bird (Streby, Loegering & Andersen, 2012), estimate the number of breeding pairs in an area by accurately counting the number of territorial males (Franzreb, 1976), delineate core breeding territories (Frantz *et al*., 2016), and determine the density of a population of a songbird species within the area

(Rimmer, Atwood, McFarland & Nagy, 1996). Observation periods were done during non-raining days, while the sampling hours were in the morning (0630 – 1030 hours) and afternoon (1630 – 1830 hours) daily. It was done by walking systematically through the study site, stopped when a song from the male bird was heard or it was observed landing on a branch tree or any perching locations through a pair of binoculars or naked eyes. Once the marked male had been identified, it would be followed 30 – 60 minute of sampling period (Barg, Jones & Robertson, 2005). If the bird disappeared from our view, or could not be located within 15 minutes, the walking activity would be continued on. As soon as the male bird moved on to other perch location, a handheld Garmin GPSMAP 78S Marine Handheld Global Positioning System (GPS) unit was used to record the coordinate of the previous perching location. The spots or perching locations which were collected after many days were then be combined to identify the space used by the marked male *C. saularis*.

Data Analysis

The perching locations of the marked male bird were plotted by using Google Earth Pro software. The collected data consisted of coordinates of the perching locations, times, and activities of the marked male bird during observation period. The territory size of the marked male bird was estimated using the non-parametric minimum convex polygon (MCP) method. It is used to delineate space used by the animal for its daily activities (Kenward & Hodder, 1998). The disadvantage of MCP is, it is sensitive to outliers and unable to show the core area used by an animal (Najmi-Hanis *et al.,* 2016). Despite these, MCP is internationally accepted technique to be used to estimate the breeding territory size due to its simplicity (Burgman & Fox, 2006). Using this MCP technique, all the outermost coordinate points collected from the studied site at Dahlia College were connected and the territorial space belonged to the marked male of *C. saularis* could be estimated.

RESULTS & DISCUSSION

There were 45 perching locations recorded throughout this study within Dahlia College, where the red spot indicated all the perching locations while the yellow-pinned symbol indicated the nest of the marked male bird together its mate (Figure 5).

Figure 5. The estimated breeding territory size of the banded male *C. saularis* in Dahlia College, UNIMAS constructed using the Minimum Convex Polygon (MCP).

This bird was found nested in the cavity of Pulai tree species (*Alstonia angustiloba*) (Figure 4). The nest was found during the middle of the incubation period. This pair had a clutch of two eggs the moment of the nest was firstly discovered. One of the eggs had been hatched and the nestling grew to become a female juvenile while the other egg was still in the incubation stage. For this species, only the female incubates the eggs while the male guards the area by perching near to its nest (Singh *et al*., 2016). The male was also frequently been seen to feed both juvenile and female in the nest. Being an insectivore species, it was observed that the male usually fed them

with insects like cockroaches and grasshoppers. Most of the time, the marked male bird was found perching and singing within its territorial area. Males of *C. saularis* spend about 47-51% of their diurnal time singing and calling (Wanniarachchi & Wijesundara, 2016).

The estimated territory size belonged to this marked male bird was 0.78 hectares. The territory size was larger compared to the study done by Singh *et al*. (2016) which was ranged from 0.17 to 0.45 hectares. The differences might be due to the number of males which were being observed during the whole sampling period. There were about 21 territorial males observed by Singh *et al*. (2016) within four years (2011-2014) study, while only one marked male individual was observed within one-month period in this present study. There is a possibility that a long-term sampling may lead to different results as observers can have more informative data on bird behaviours and nesting success if compared to a short-term sampling (Yap, 2003). In addition, the territory sizes of this bird species may be different from one year to another (Yap, 2003).

Another factor that need to be considered is the effectiveness applying the spot-mapping method. This method is preferable to be applied during breeding season. Franzreb (1976) stated that breeding season is the only time birds utter territorial songs and guard their territories from any intruders. During the data sampling, the observed pair birds were in the middle of incubating their one egg and provisioning one nestling. However, the female did not complete incubating the last egg and it went missing from the nest probably it had been taken by a predator. Hence, the data sampling could not be achieved for the whole breeding duration for this pair, and this might affect the breeding territory size of the marked male bird.

CONCLUSION

The spot-mapping technique is one of the methods that can be applied to estimate the breeding territory size of a male of *C. saularis* and any other passerine bird species. The obtained data can be used to understand the breeding behaviours of this species during breeding season. In future, it is recommended to use the advanced radio telemetry instead of the spot-mapping technique as the former method can estimate three times larger of a territorial size compared to the later technique. By using the radio telemetry, the used space by the studied bird species within its breeding territory area can be covered more. In addition, it is recommended that the study area shall be expanded into the Samarahan Country Club, which is located next to UNIMAS. Based on our observations, most of the individuals of *C. saularis* were observed to fly into the area. Expansion of the study area in future, may increase the accuracy of estimation of the space used by this songbird species within Kota Samarahan.

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Fish Endoparasites from Streams near Paddy Fields in Serian and Padawan, Western Sarawak

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ABSTRACT

The fish health status and parasitic infection in paddy fields are understudied in Borneo. This study was done to compare the prevalence and abundance of parasites on freshwater fishes in the upstream and downstream rivers of paddy fields. Parasite study on freshwater fishes was done by collecting live fish samples using ten minnow traps with baits at each site in Serian and Padawan, Sarawak, from October 2017 until March 2018. A total of 120 freshwater fishes were examined during this study period. Cold anaesthesia was applied on live samples prior to ectoparasite and endoparasite microscopic screening, which involved scraping of outer body mucous and removal of fish intestines, respectively. No ectoparasites were recovered from the fish samples. A total of 19 (15.83%) fishes from Cyprinids were infected with endoparasites. From these, 58 individuals of endoparasites were recovered. Two groups of parasites, namely Nematoda (*Cucullanus* sp.) and Trematoda (unidentified), were recovered from the fish intestines. From this study, there was a significant difference between the upstream fishes and downstream fishes in their endoparasite infection at both Triboh Village ($p = 0.035$) and Annah Rais Village ($p = 1.445 \times 10^{-6}$) using two samples t-test. The endoparasite abundance in fish was higher in the streams where there was less human disturbance. This study may serve as a baseline study on the parasitic infections of freshwater fishes in streams near paddy fields or other agricultural area in Sarawak.

Keywords: Borneo, freshwater fish, parasite infection, rice fields

INTRODUCTION

Freshwater fishes can be infected with parasites because they consumed small crustaceans that might have previously fed on parasite eggs or larvae (Hilderbrand, Price & Olson, 2003). In addition, they can transmit the parasites by becoming food for many other vertebrates (Barber & Wright, 2006). The variations in the mechanism of parasitic infections towards the fishes could be attributed to abiotic and biotic conditions of the environment. As described by Ejere *et al*. (2014), unfavourable environmental conditions, such as adverse temperature, may offset fish physiology and thus leads to parasitic infection.

Some of the common parasites that are known to infect freshwater fishes include protozoans, trematodes, nematodes, cestodes, acanthocephalans, copepods and hirudineans (Iyaji & Eyo, 2008). Parasites can cause mechanical damages such as discolouration to the gills of fish. In more chronic cases, infected fish will wear down, turn pale, develop white spots and increase in mucous secretion (Toksen, 2007). Apart from that, parasites can cause physiological damage such as cell proliferation, which was found similar to human diseases and may act as a causative agent for carcinogenesis in fish species (Iwanowicz, Black, Blazer, Zappia & Bryant, 2016). Damages on fish reproductive ability by parasites were also reported. Examples include decreased female fecundity by reduction in embryo production (Deaton, 2009) and male fishes also avoid mating with parasitized females (Buchholz, 2004; Richards, van-Oosterhout & Cable, 2010).

There was a massive expansion in the agriculture industry in Malaysia and small to large-scale agriculture activities were observed in many rural areas. This industry may have environmental effects towards the community that lives in these areas. Paddy plantation is one of the examples of agriculture industry that depletes the environment (de Miranda, Fonseca, Lima, de Moraes & Rodrigues, 2015). As such the unionized ammonia concentration in the water can cause health depletion of fish and other organisms due to an increase in water pH of nearby river or stream, particularly so after applying nitrogen-rich fertilizer (Halwart & Gupta, 2004). Unhealthy fish may lead to increase susceptibility to parasitic infection. Besides that, the villagers living around the area also depend on the fishes from the river for food source.

There is still lacking published literature on parasitic infections of freshwater fishes in Borneo. It is necessary to understand the health status and parasite susceptibility of local freshwater fishes, which could be useful in understanding the conservation status of freshwater fishes in this region. The objective of this preliminary study was to identify the composition and parasitic infection of fishes on both upstream and downstream rivers near the paddy fields.

MATERIALS & METHODS

Study Sites and Fish Sampling

Field samplings were carried out from September 2017 until early March 2018 where the fishes were collected from the freshwater streams or rivers near the paddy fields at Triboh Village (Serian) and Annah Rais Village (Padawan). Minnow traps with fish pellets as baits were used for fish samplings. A total of five small minnow traps and five large minnow traps were set up at each station. The minnow traps were set up at two different stations at each sampling site, which were the forested upstream river and downstream river near the paddy fields. The traps were checked twice a day at 0900 hours and 1400 hours. A total of 30 fishes were caught at both upstream and downstream stations at each site, which makes up 120 fishes altogether. Fish identification was done based on several important external morphologies such as standard length (SL), total length (TL), weight (kg) and by looking at the fin shape and snout shape. Fish identification was done using reference books by Atack (2006) and Inger and Chin (2002).

Parasite Determination

After fish samplings, the fishes were kept inside an aquarium or a container to keep the fish alive temporary. Fishes were killed humanely by euthanization, which was done by placing the live fish in a cooler filled with iced water. The outer body mucous was collected by scraping in a skull-tail direction. The collected mucous were placed on clean glass slides, mixed with saline solution, and examined under a compound microscope with 10 X and 40 X magnifications to detect ectoparasites (Biu, Diyaware, Yakaka & Joseph, 2014). The whole-body cavity of fish was dissected to remove the intestine. The intestine was then placed inside a Petri dish containing distilled water and was cut open longitudinally. The Petri dish containing fish intestine was then incubated in an incubator at 40° C and observed under a stereomicroscope every 10 minutes for the presence of endoparasites. Parasites were identified up to species level, if possible, by comparing their morphological structures with published references by Yamaguti (1963), Dailey (1996) and Roberts, Schmidt and Janovy (2009).

Scanning electron microscope (JSM-6390LA; Jeol Ltd., Tokyo, Japan) was also used to make a three-dimensional image of the surface of the parasite specimen. Before proceeding to scanning electron microscope, the samples were fixed in 2% glutaraldehyde and then dehydrated using graded ethanol series (60%, 70% and 100%) for approximately 30 minutes to one hour. The samples were then subjected to Critical Point Drying (CPD) for approximately 8 hours. After the drying process, the samples were placed on aluminium plates and coated with gold before observed under the scanning electron microscope.

Data Analysis

The statistical analysis was done by using Paleontological Statistics (PAST) software to calculate the parasite's mean intensity, prevalence and parasite's abundance. Statistical t-test was used to compare data of upstream and downstream rivers for each sampling site. Below is the formulation used to calculate prevalence, mean intensity and abundance of parasites (Bush, Lafferty, Lotz & Shostak, 1997).

$$\text{Prevalence} = \frac{\text{Number of fish infected}}{\text{Number of fish examined}} \times 100$$

$$\text{Mean intensity} = \frac{\text{Number of the parasites collected}}{\text{Number of infected host}}$$

$$\text{Abundance} = \frac{\text{Number of parasites collected}}{\text{Number of the host examined}}$$

RESULTS

In this study, freshwater fishes were collected in the upstream and downstream rivers near the paddy fields in two villages located at Serian and Padawan, Sarawak. The upstream river of Triboh village is a medium-sized stream situated in between small-scale orchards owned by local villagers. Meanwhile, in the downstream river near a paddy field in Triboh Village, there were few houses at the riverbanks. The downstream river was a place where the villagers will sometime look for fishes as food source, while some villagers utilize this water source as their laundry place. A few of the villagers who live near the riverbank also kept livestock at the back of their house, and whenever they clean the shelters of their animals, the dirty water will flow into the downstream river. Annah Rais Hotspring, which is a tourism spot, served as the upstream river for the second sampling site. The river water was clear, and cyprinids were seen clearly in the water. During the time of sampling, the farmers were harvesting paddy and thus, assumed to no longer spraying pesticides. A total of 120 fishes were sampled, which represented four families (i.e. Cichlidae, Cyprinidae, Helostomatidae and Mastacembelidae) (Table 1). From this, 30 fish samples were caught from each upstream and downstream station at both villages. *Barbodes* genus was the most abundant fishes found in both upstream and downstream rivers at Triboh Village and Annah Rais Village. Only family Cyprinidae inhabited at upstream regions at both Triboh Village and Annah Rais Village. In the downstream region of Triboh Village, more fish species were found. These include fishes from family Cichlidae, Cyprinidae, Helostomatidae and Mastacembelidae.

Table 1. Freshwater fishes in the upstream and downstream rivers near the paddy fields at Triboh Village and Annah Rais Village, Sarawak.

Site	Family	Species	Individual(s)
		Upstream	
Triboh	Cyprinidae	*Barbodes binotatus*	3
		Barbodes everetti	3
		Barbodes sealei	15
		Puntius orphoides	1
		Rasbora caudimaculata	3
		Rasbora sumatrana	5
Annah Rais	Cyprinidae	*Barbodes binotatus*	7
		Barbodes sealei	20
		Rasbora sumatrana	3
		Downstream	
Triboh	Cichlidae	*Oreochromis niloticus*	4
	Cyprinidae	*Barbodes sealei*	20
		Barbodes binotatus	1
	Helostomatidae	*Helostoma temminckii*	4
	Mastacembelidae	*Macrognathus maculatus*	1
Annah Rais	Cyprinidae	*Barbodes binotatus*	1
		Barbodes everetti	3
		Barbodes sealei	13
		Rasbora sumatrana	13
			120

Nematodes in *Rasbora sumatrana* and *Barbodes sealei*

The fishes were first screened for the presence of ectoparasite and through the screening process; none of the fishes were infested with ectoparasite. A total of 58 individuals consisting of two taxonomic groups of enparasites were recovered from the intestines of the examined Cyprinids in this study. Figure 1 and Figure 2 represent the images of endoparasites (nematodes and trematodes) retrieved from Cyprinids fishes. Identification of these endoparasites up to species level was not possible due to the lack of intact images on the morphological structures. Based on Dailey (1996), the most likely endoparasite group is nematode (Figure 1) and it resembled *Cucullanus* sp. due to the club-shaped swelling on the anterior part (Dailey, 1996).

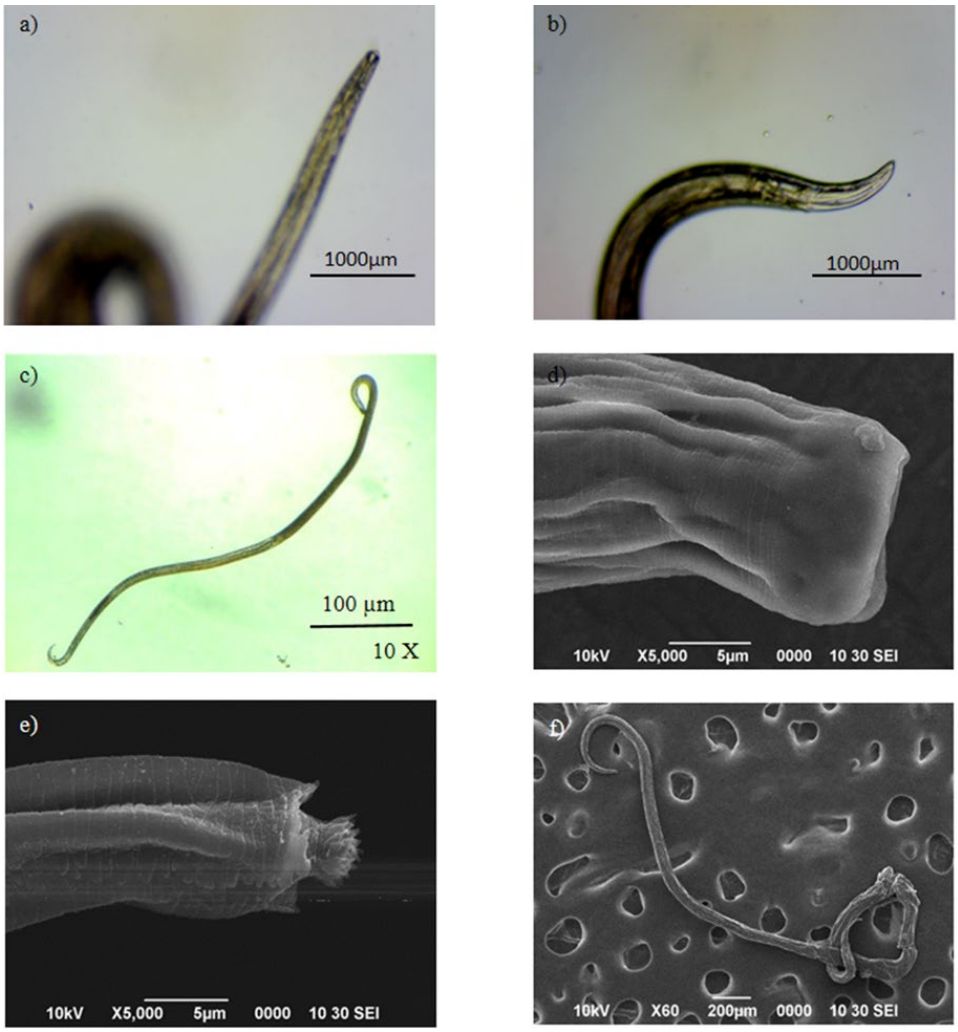

Figure 1. *Cucullanus* sp. recovered from the intestine of *Rasbora sumatrana* and viewed under both compound and scanning electron microscopes. a) anterior part, b) posterior part, and c) full-size view of nematode viewed under compound microscope. d) anterior part, e) posterior part, and f) full-size view of nematode viewed under scanning electron microscope.

Unidentified Trematode in *Rasbora Sumatrana*

Figure 2 is the images of a trematode parasite recovered from *Rasbora sumatrana* under compound and scanning electron microscope.

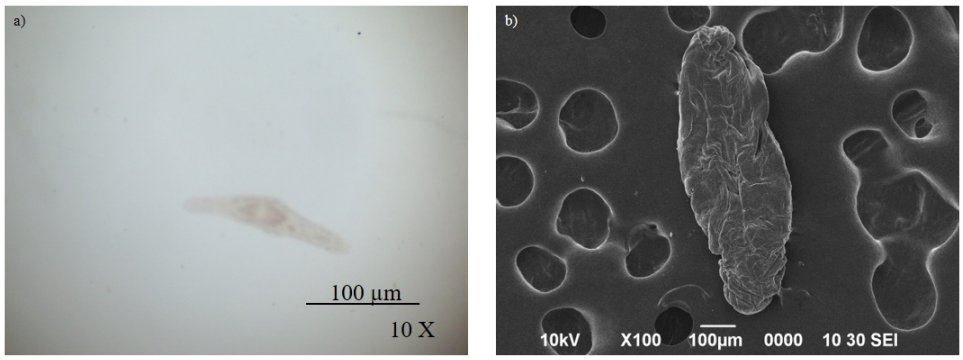

Figure 2. Unidentified trematode recovered from the intestine of *Rasbora sumatrana* and viewed under both compound and scanning electron microscopes. a) full-size view of trematode under stereomicroscope b) full-size view of trematode under scanning electron microscope of full-size view of unidentified trematode.

Comparison of Fish Endoparasite Infection in the Upstream and Downstream Rivers

A total of 58 endoparasites were found in 19 infected fishes in upstream and downstream rivers in both locations (Table 2). A total of 51 individuals of enparasites were identified as nematodes due to their cylindrical and filiform morphologies (Kabata, 1985) meanwhile seven individuals were identified as trematodes by the presence of oral or ventral sucker at the mouthpart. All endoparasites were recovered in the fish intestines. Based on the observation under microscope, most measurements cannot be completed due to the poor vision of the nematode organ or special characteristics such as the reproductive organs and digestive organs. Based on Table 2, *R. sumatrana* shows the highest endoparasite infection prevalence with 45 endoparasites recovered from 11 infected individuals. This was followed by *Barbodes sealei* (12 endoparasites from seven infected individuals) and *Barbodes binotatus* (one endoparasite individual from an infected host). All the other species of fishes sampled at upstream and downstream of both villages were not infected with endoparasite.

Table 2. Endoparasites recovered from their host at two local villages (Triboh and Annah Rais Villages) in Western Sarawak.

Fish Species	n	Number of fish individuals with endoparasites recovered		Endoparasites infection (%)	Number of parasites recovered	Endoparasite Mean intensity
		Presence	Absence			
Cichlidae						
Oreochromis niloticus	4	0	4	0.00	0	0.000
Cyprinidae						
Barbodes binotatus	12	1	11	8.33	1	1.000
Barbodes everetti	6	0	6	0.00	0	0.000
Barbodes sealei	68	7	61	10.29	12	1.714
Puntius orphoides	1	0	1	0.00	0	0.000
Rasbora caudimaculata	3	0	3	0.00	0	0.000
Rasbora sumatrana	21	11	10	57.14	45	4.091
Helostomatidae						
Helostoma temminckii	4	0	4	0.00	0	0.000
Mastacembelidae						
Macrognathus maculatus	1	0	1	0.00	0	0.000
TOTAL	**120**	**19**	**101**		**58**	

The endoparasite prevalence of fishes was high at the upstream river (30%) near a paddy field at Triboh Village and the downstream river (23%) of a paddy field at Annah Rais Village (Table 3). Statistical analysis using two samples t-test showed that the parasitic infection between the upstream and downstream rivers near the paddy fields was significantly different for both Triboh Village ($p=0.035$) and Annah Rais Village ($p=1.44 \times 10^{-6}$). Meanwhile, the endoparasite mean intensity of fish in the upstream rivers was also slightly higher (5.56) compared to in the downstream river (3.71). The abundance of parasites was also recorded higher in the upstream river (1.40) as compared to the downstream river (0.53).

Table 3. The endoparasite prevalence, mean intensity and abundance of freshwater fishes in upstream and downstream rivers in two local villages in western Sarawak.

Sources	Host individuals		Parasite individuals recovered	Prevalence (%)	Mean intensity	Parasite abundance
	Infected	Examined				
			Upstream			
Triboh	9	30	41	30.00	4.556	1.367
Annah Rais	1	30	1	3.33	1.000	0.033
Overall	10	60	42	33.33	5.556	1.400
			Downstream			
Triboh	2	30	4	6.67	2.000	0.133
Annah Rais	7	30	12	23.33	1.714	0.400
Overall	9	60	16	30.00	3.714	0.533

DISCUSSION

This study shows that the upstream river in Triboh village harboured more fish species (n=6) compared to the downstream river (n=5). Two of the species found in downstream (*Oreochromis niloticus* and *Helostoma temminckii*) were fishes that escaped from the nearby aquaculture at the riverbank but entered the minnow traps that were set up in the region. Hence, these fishes were not originally inhabitant in the river. The downstream river

was not fast flowing and *Rasbora* species were not found in this region. On the other hand, *Barbodes* individuals can live in both slow and fast flowing waters (Martin-Smith, 1998), hence, making them abundant in both upstream and downstream rivers.

In the upstream of Annah Rais Village, there were only three fish species caught using minnow traps compared to four species at the downstream. Tourists were seen at the upstream river, which made it quite difficult for sampling. A lot of fish species were observed swimming around the traps, but not all entered the minnow traps. Another possible reason could be due to the baits used were not effective enough to lure all kinds of fishes. According to Brasher (2003), the presence of human disturbance has resulted in lower water quality and degraded physical habitats for many native stream species. The downstream river at Anna Rais Village has less human disturbance possibly due to the difficulty in accessing the area. Thus, it was a little easier to sample for fish. The farmers were also no longer seen spraying pesticides since it was already harvesting season for paddy.

The fish species that showed the highest endoparasite infection was *R. sumatrana*. This may be due to the diets of *Rasbora* that were primarily exogenous insects from mid-water position, although some stomach contained seeds and leaves (Bishop, 1973). In addition, invertebrates are significant to become the first intermediate hosts of parasites larvae. Most of the fish samples were *B. sealei,* which was found to bear little parasites from this study, or in other words, a species suspected with a strong immune system or more resistant to endoparasite infection.

In this study, the percentage of infected fish individuals was higher in the upstream rivers in Triboh Village compared to downstream rivers situated near the paddy fields. According to Pilosof, Dick, Korine, Patterson and Krasnov (2012), parasite abundance can increase where the local conditions of the environment promote the parasite development but will decrease where the environmental contaminants are harmful to the parasite. For instance, upstream fishes living in the ideal environment with forest area may provide the opportunity for the parasites to develop in the body of their host. While in the downstream river near a paddy field in Triboh village, the usage of pesticides such as herbicides in paddy fields to wilt other plants that grow on the land might cause these pollutants discharge to flow through the soil and to the nearby streams. Thus, downstream fishes may be more exposed to toxic pollutants in their habitat and hence unsuitable for the parasites to live in. Environmental effects or other anthropological activities may have both direct and indirect effects towards the abundance of parasites. Chapman, Marcogliese, Suski and Cooke (2015) mentioned that environmental conditions and pollutants have effects on the differences in abundance and community structure of parasites in fish. These different variables may become the drivers of the parasite abundance, prevalence and mean intensity in this study. According to Lafferty and Kuris (1999), although parasites may increase in association with other stressors, their population may also decrease due to the complexity of their life cycles, which makes them susceptible to other wider range of disturbances. Lafferty (1997) stated that toxic chemicals have a consistent negative effect on helminths, such as trace metals killing free-living parasites while reducing the infection rate of snails in polluted water (Siddall & Clers, 1994).

This study observed contradicting result at Annah Rais village in which the prevalence of parasites in freshwater fish was high in the downstream river. This might be explained by the presence of a resort at the upstream river, which was constantly occupied with human. Here, human disturbances may play a role in suppressing the aquatic invertebrates, which are the major food sources for the fish and might greatly affect the ecosystem services (Olson, Stewart & Thompson, 2016). This suggested that human interference may directly or indirectly influence the survival of the parasites in freshwater fish as well. Meanwhile, the freshwater fishes at downstream river near a paddy field in Annah Rais Village had higher endoparasite prevalence. The time of sampling may play a crucial role in the endoparasite infection of the fishes since sampling at this site was done during harvesting season, hence there were not much pesticide effluents in the river system during this period.

The endoparasites recovered from the fishes were *Cucullanus* sp. and unidentified trematode. Nematodes are endoparasites that are usually found living in the intestine. Shaharom (2012) stated that the important morphologies for identifying nematodes are their anterior and posterior parts. The parasite samples were delicate and likely to tear upon repositioning and its vulnerability to break after Critical Point Drying (CPD) process, thus have made it difficult to identify the species of parasites. Previous study on paddy field fishes in Malaysia showed that the common nematodes obtained were *Cucullanus* sp*., Spinictus inermis,* and *Capillaria* sp. (Rahman & Bakri, 2008).

CONCLUSION

A total of 120 individuals of freshwater fish were caught in this study, ranging from Family Cichlidae (*Oreochromis niloticus),* Cyprinidae *(Barbodes binotatus*, *B. everetti*, *B. sealei, Puntius orphoides, Rasbora caudimaculata* and *R. sumatrana)*, Helostomatidae (*Helostoma temminckii)* and Mastacembelidae (*Macrognathus maculatus*). From these, 58 individuals of endoparasites were recovered from 19 individuals of host fish from Family Cyprinidae. Two parasite groups (Nematoda and Trematoda) were collected from the intestine of the fish samples. From this study, the parasite abundance was higher in the streams where there was less human disturbance, such as the upstream rivers with forest area in Triboh Village and downstream rivers near a paddy field in Annah Rais Village.

To note, the data presented here only serves as a preliminary result since it was generated from small sample size within a short sampling period and using only a single type of fish trap. It is recommended to have a longer sampling period so that more sites can be covered with different fish traps to compare more freshwater fish samples and to understand better the influence of paddy plantation towards the river community and parasite loads. To provide a better insight into the mechanisms of parasitic infestation in paddy fishes, fish samples should be obtained throughout the planting and harvesting seasons. The data obtained in this study may serve as a baseline study on parasitic infections of freshwater fish and how the environment plays a role in their community structure in this region.

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Comparative Prevalence of Ectoparasitic Fauna on Birds from Selected Mainland and Island of Sarawak

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ABSTRACT

A survey of ectoparasitic fauna on birds was conducted in October 2017 until January 2018. The aims of this study were to investigate the ectoparasitic fauna on birds and to compare its prevalence in the selected mainland and island of Sarawak. A series of sampling by using mist-net has been done in Mount Sadong and Satang Besar Island with a total of 1440 hours of sampling effort for each locality. A total of 53 individuals of birds were captured and examined for its ectoparasites. Twenty-one species of ectoparasites were recorded comprising four species of lice and 17 species of mites. Four species of lice and 11 species of mites were detected in Mount Sadong while eight species of mites and no lice were detected in Satang Besar Island. The prevalence of ectoparasites infested on birds in Mount Sadong (33.33%) was higher than Satang Besar Island (17.39%). The *p*-value (p= 0.474) indicated there was no significant difference between the prevalence of ectoparasites from both localities. The result is important since ectoparasites infestation could affect the survival of birds and has the potential transmission of zoonotic disease.

Keywords: Bird, ectoparasites, island, mainland, prevalence, Sarawak

INTRODUCTION

Borneo is a huge landmass that provides a home to the biodiversity of tropical life which occupied more than 650 species of birds in which 52 species of them are endemic (Myers, 2016). Birds are the most successful vertebrate group among the others and play their important role as predators, pollinators, scavengers, seed dispersers, and ecosystem engineers (Whelan, Wenny & Marquis, 2008). However, the bird richness may have affected by the distance between the island and the nearest mainland as only certain bird species or families have the ability to disperse far away to the islands (Dalsgaard *et al.,* 2014). This factor may cause remote islands to have smaller numbers of species than the mainland (Kalmar & Currie, 2006; Kier *et al*., 2009; Simberloff, 1995). Thus, the ectoparasites on birds in the island may tend to have a lower prevalence than the mainland as they increase their preference to one or a few specific hosts due to the limited diversity of birds.

A study by Brown, Brown and Rannala (1995) reported the parasitised birds had an annual survivorship 12% lower than non-parasitised birds. Their findings indicated that the ectoparasites infestation could affect the long-term survival of their host (Sajid & Ehsan, 2017). However, the study of the ectoparasitic fauna on birds was given less priority and almost neglected, due to less contact with human and they are not subjected to sources of protein for human. To date, there is still lacking published data on ectoparasites of birds available in Malaysia in which most of the studies were pertaining to Peninsular Malaysia. In addition, most of the publications locally are subjected to consumable poultry. Therefore, this study is intended to recover the ectoparasitic fauna on the birds and compare their prevalence from selected mainland and island in Sarawak to serve as preliminary references for future understanding on the ecological role of ectoparasites in regulation of population of birds as well as to develop the conservation not solely on bird species but also their habitats.

MATERIALS & METHODS

Sampling Sites

This study has been conducted within October 2017 to January 2018 in Mount Sadong (1.21 ^{o}N, 110. 50 ^{o}E) and Satang Besar Island (1.79 ^{o}N, 110.17 ^{o}E) (Figure 1). Mount Sadong was considered as a secondary forest that consists of bamboo vegetation, orchards, and small bark trees. This study covered the foothill of the mountain to the hilly area. Satang Besar Island was also considered as a secondary forest which consists of bamboo, small bark trees and the forest floor were mostly covered with leaf litter. This study was covered the island edges to the hilly area.

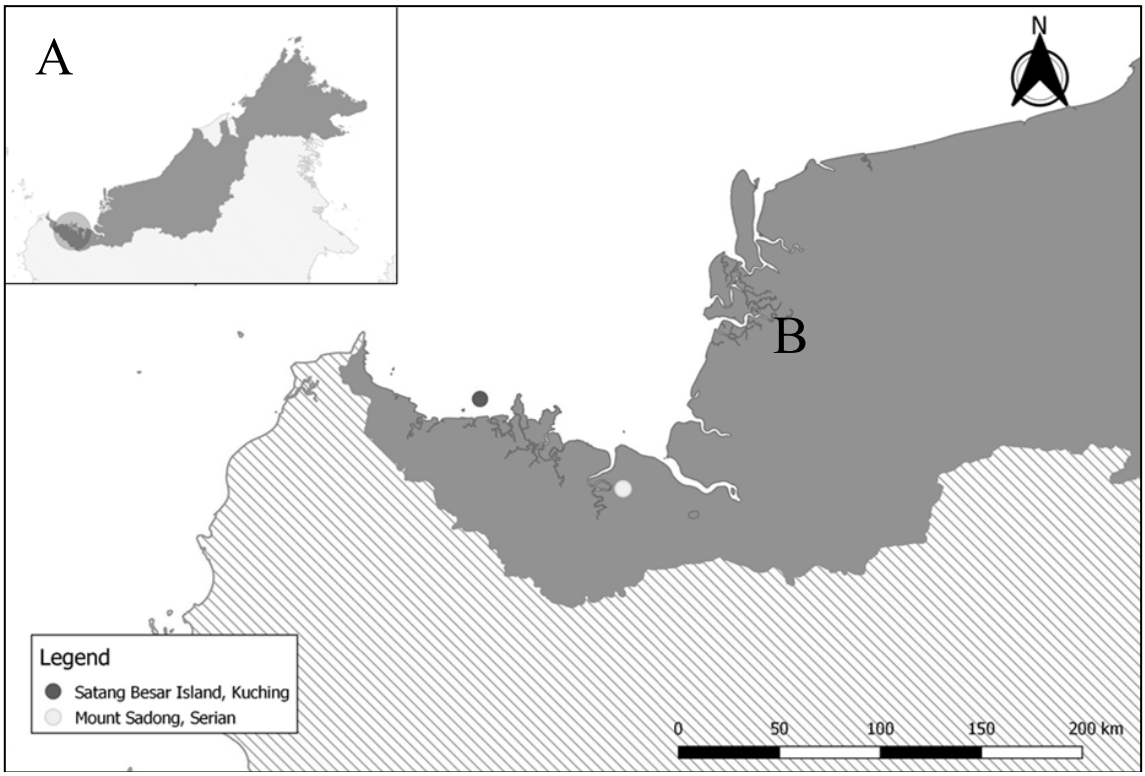

Figure 1. A - Malaysian Borneo of Sabah and Sarawak; B - The tip of Sarawak and two localities where ectoparasites of birds in mainland and island were sampled. (Source: QGIS software)

Sample Collection

Fifteen mist nets were set in Mount Sadong and 30 mist nets were set in Pulau Satang Besar to maximise and balance the sampling efforts for both sides (total effort of 1440 sampling hours). The mist nets were checked once every two hours' interval from 0600 to 1800 hours. Each bird trapped in the mist net was removed and placed in a cleaned cloth bag to prevent contamination of ectoparasites to the other host. The identification of birds was conducted based on Phillipps and Phillipps (2014), and Myers (2016). Each bird was ringed with a specific identification number on tarsus to avoid reassessment. The birds were scanned by visual examination and the ectoparasites were collected by using forceps from the different body parts of the bird. The ectoparasites of each bird were preserved in a vial containing 70% ethanol separately with the label of ring number, host species, sex, location, date of collection and the collector's name. Then, the examined birds were released and all collected ectoparasites have been brought to the Parasitology laboratory, Universiti Malaysia Sarawak for further identification.

Mounting & Identification

The mounting process followed Madinah, Abang, Mariana and Abdullah (2011) with some modifications. The ectoparasites were sorted accordingly based on their morphology under a stereomicroscope. All ectoparasites were prepared by soaking in lactophenol (clearing agent) solution at room temperature for three hours depends on the size before mounting in Canada Balsam. The mounted slides were incubated at room temperature for a week to harden the mounting medium. Then, mounted ectoparasites were observed under a compound microscope and identified to genera and species level as possible according to the keys and illustrations offered by Atyeo and Peterson (1970), Constantinescu, Chişamera, Mukhim and Adam (2014) and Price and Graham (1997).

Data Analysis

Statistical analyses were performed using PAST Software version 3.20 following Hammer (2000). Two-sample *t*-test was used to explore the differences in prevalence among the two habitats. The *p*-values below 0.05 were considered as significant. A probability value of less than 0.05 was considered statistically significant.

RESULT

Host Collection

A total of 53 individuals of birds comprising 20 species from 12 families were captured from both the mainland and island (Table 1) were examined for its ectoparasites. Mount Sadong recorded a total of 30 individuals of birds captured which consists of 14 species from nine different families while a total of 23 individuals of birds were captured from the Satang Besar Island which consist of nine species from eight different families. The most abundant species captured in Mount Sadong was Little Spiderhunter (*Arachnothera longirostra*) with a total of nine individuals. Differ in Satang Besar Island, the most abundant species captured was Olive-winged Bulbul (*Pycnonotus plumosus*) with a total of 12 individuals. Based on the Wild Life Protection Ordinance (WLPO) 1998, five out of 20 species of birds captured were categorised as "Protected" species and the rest was not listed in any schedule in WLPO 1998. Meanwhile, based on the International Union for Nature (IUCN) Red List of Threatened Species 2017-3, Roul roul (*Rollulus rouloul*) and Green Broadbill (*Calyptomena viridis*) was listed as "Near Threatened", nine out of 20 species captured were "Least Concerned" and only Chesnut-winged Babbler (*Stachyris erythroptera*) was still not evaluated.

Table 1. List of bird species caught in both Pulau Satang Besar and Mount Sadong.

Order/ Family	Common/Species name	WLPO 1998	IUCN 2017	MS	SBI	Total
Columbiformes						
Columbidae	Emerald Dove *Chalcophaps indica*	NL	LC	4	2	6
Coraciiformes						
Alcedinidae	Rufous-backed Kingfisher *Ceyx erithaca*	P	LC	3	0	3
	Stork-billed Kingfisher *Pelargopsis capensis*	P	LC	0	1	1
Cuculiformes						
Cuculidae	Chestnut-winged Cuckoo *Clamator coromandus*	NL	LC	0	1	1
	Hodgson's Hawk Cuckoo *Hierococcyx nisicolor*	NL	LC	0	2	2
Galliformes						
Phasianidae	Roul roul *Rollulus rouloul*	p	NT	2	0	2
Passeriformes						
Eurylaimidae	Green Broadbill *Calyptomena viridis*	NL	NT	2	0	2
Laniidae	Tiger Shrike *Lanius Tigrinus*	NL	LC	0	1	1
Muscicapidae	Blue-and-white Flycatcher *Cyanoptila cyanomelana*	NL	LC	1	0	1
	White-rumped Shama *Copsychus malabaricus*	P	LC	1	2	3
Nectariniidae	Brown-throated Sunbird *Anthreptes malacensis*	NL	LC	1	1	2
	Little Spiderhunter *Arachnothera longirostra*	NL	LC	9	0	9
	Purple-naped Sunbird *Hypogramma hypogrammicum*	NL	LC	1	0	1
	Yellow-eared Spiderhunter *Arachnothera chrysogenys*	NL	LC	1	0	1
Pycnonotidae	Cream-vented Bulbul *Pycnonotus simplex*	NL	LC	1	0	1
	Olive-winged Bulbul *Pycnonotus plumosus*	NL	LC	0	12	12
Timaliidae	Chesnut-winged Babbler *Stachyris erythroptera*	NL	NE	1	0	1
	Grey-headed Babbler *Stachyris poliocephala*	NL	LC	1	0	1
Rhipiduridae	Pied Fantail *Rhipidura javanica*	NL	LC	0	1	1
Piciformes						
Picidae	Rufous Piculet *Sasia abnormis*	P	LC	2	0	2
TOTAL				30	23	53

Keys: IUCN – IUCN Red List of Threatened Species 2017-3 (Red Data Book); WLPO – Sarawak Wild Life Protection Ordinance 1998; SBI – Satang Besar Island; MS – Mount Sadong; P – Protected; NL – Not Listed; NT – Near Threatened; LC – Least Concern; NE – Not Evaluated.

Prevalence of Ectoparasite Species

Two groups of ectoparasites were discovered from the birds captured which are lice and mites. A total of 354 individuals belongs to 21 species of ectoparasites were collected from birds in both localities comprising four species of lice and 17 species of mites (Table 2). Fifteen species of ectoparasites (four species of lice and 11 species of mites) were recorded in Mount Sadong while eight species of ectoparasites (all mites) were recorded in Satang Besar Island. White-rumped Shama (*Copsychus malabaricus*) was reported to have the largest number of ectoparasites individuals with a total of 109 ectoparasite individuals and Pied Fantail (*Rhipidura javanica*) with a total of 79 individuals of ectoparasites for mainland and island respectively. The highest recorded number of ectoparasites species in both localities was *Trouessartia* sp. with a total number of 236 individuals.

The highest recorded prevalence of ectoparasites (Table 3) in the mainland was *Trouessartia* sp. (10%) followed by *Lipeurus* sp. and *Philopteroides* sp. (both 6.67%) then by the other ectoparasites (3.33%). For the island, the ectoparasites that hold the highest prevalence were similar to the mainland, *Trouessartia* sp. (17.39%) then followed by the other ectoparasites (4.35%). Overall, there were 10 birds were infested with ectoparasites (33.33%) in Mount Sadong with the mean intensity value of 24.2 and only four out of 23 individuals examined in Satang Besar Island were infested by ectoparasites (17.39%) with the mean intensity value of 29.5. Considering all ectoparasites, there were no significant differences in the prevalence of ectoparasites between both sites (p= 0.474).

DISCUSSION

In this study, 14 species of birds were recorded from Mount Sadong which is comparatively equivalent to the previous study conducted in several mainlands of Sarawak, with a number of 27 to 35 species of birds were reported (Sodhi, 2002; Tuen *et al*., 2006). However, only nine species of birds were recorded in Satang Besar Island. Simberloff (2000) explained the lower number of species in the islands than in the mainland was due to reduce in area, increase isolation to nearby mainland and lack of habitat present. The most abundant bird in Mount Sadong was Little Spiderhunter (*Arachnothera longirostra*) with a total of nine individuals recorded. According to Davison and Chew (2016), this nectarivore species is common and most numerous in plantain garden, which compatible to orchard vegetation in Mount Sadong. The most abundant species captured in Satang Besar Island was Olive-winged Bulbul (*Pycnonotus plumosus*) with a total of 12 individuals. This insectivore and frugivore species inhabit forest edges and also present in island habitat (Davison & Chew, 2016), which matched the sampling site in Satang Besar Island that covered from the forest edges to the hilly area.

In Malaysia, the study of ectoparasites on birds was given less priority due to not subjected to pest management of poultry. The publication on avian ectoparasites still low in number locally. In this study, ectoparasites found were categorised in two groups of arthropods namely lice and mites. Evidently, 21 species of ectoparasites have been recorded from both localities which consist of 15 species of ectoparasites recorded in Mount Sadong. Meanwhile, only eight species of ectoparasites were recorded in Satang Besar Island. Rusli (2007) recorded 20 species of ectoparasites on birds in oil palm plantation. Meanwhile, eight species of ectoparasites on birds have been reported by Asrif, Nurqamareena and Chong (2018) in rice field. It is remarkable that different ectoparasites species were found in different populations (Barrientos, Valera, Barbosa, Carrillo & Moreno, 2014). This might due to host diversity, behaviour, morphology, geographic range and life history (Hughes & Page, 2007).

The presence of lice could be explained by the presence of their host, this cannot be argued for the no lice recorded on the island. Lice are permanent ectoparasites in which they complete their entire life cycle on the host body (Johnson & Clayton, 2003; Marshall, 1981; Murray, 1990; Rozsa, 1997). For instance, *Lipeurus* sp. and *Goniodes* sp. Have the same host group which is the Old World gallinaceous birds (Price & Graham, 1997). This was approved by several previous studies found on domestic chickens and turkeys (Rahman & Haziqah, 2015; Zarith, Suhaila, Izzauddin & Khadijah, 2018) and also wild chicken in Thailand, Laos, and the Philippine Islands (Price & Graham, 1997). In this study, both ectoparasite species were found only on Roul roul (*Rollulus rouloul*) which is a member of family Phasianidae from order Galliformes, the gallinaceous birds. In this study, Roul roul (*Rollulus rouloul*) was only present on the mainland, thus revealed the reason for the absent of *Lipeurus* sp. and *Goniodes* sp. in the island.

The *Trouessartia chionidis* were present in both habitats. Evidently, their infestation was subjected to host from Family Muscicapidae with high number of individuals and one individual was found on Yellow-eared Spiderhunter (*Arachnothera chrysogenys*) from Family Nectaritiidae. Lyra-Neves, Farias and Telino-Júnior (2003) have been mentioning that feather mites are very specific to birds' families, genera, and even species. Genus *Trouessartia* is exclusively associated with their passerine host (Minorov & Kopij, 2000). In this study, the birds that infested by *Trouessartia chionidis*, were White-rumped Shama (*Copsychus malabaricus*), Blue-and-white Flycatcher (*Cyanoptila cyanomelana*), Pied Fantail (*Rhipidura javanica*) and the Yellow-eared Spiderhunter (*Arachnothera*

Table 2. The number of ectoparasite individuals collected on its host in Mount Sadong and Satang Besar Island.

	Ectoparasites	Host																								Total
		Mainland														Island										
		Emerald Dove	Rufous-backed Kingfisher	Roul roul	Green Broadbill	Blue-and-white Flycatcher	White-rumped Shama	Brown-throated Sunbird	Little Spiderhunter	Purple-naped Sunbird	Yellow-eared Spiderhunter	Cream-vented Bulbul	Chesnut-winged Babbler	Grey-headed Babbler	Rufous piculet	Emerald Dove	Stork-billed Kingfisher	Chestnut-winged Cuckoo	Hodgson's Hawk Cuckoo	Tiger Shrike	White-rumpped Shama	Brown-throated Sunbird	Olive-winged Bulbul	Pied Fantail	
Lice	**Philopteridae**																									
	Lipeurus sp.	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	Philopteroides sp.	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Sp. 4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Goniodidae																									
	Goniodes sp.	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Mites	**Dermanyssidae**																									
	Dermanyssus sp.	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Proctophyllodidae																									
	Pedanodectes angustilobus	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Proctophyllodes glandarinus	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-	-	7
	Proctophyllodes sp.	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	9
	Pterodectes sp. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
	Pterodectes sp. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	3
	Pterodectes sp. 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	6
	Trouessartiidae																									
	Trouessartia chionidis	-	-	-	-	98	57	-	-	-	1	-	-	-	-	-	-	-	-	-	26	-	-	53	236
	Trouessartia sp. 1	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52
	Trouessartia sp. 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	15
	Unidentified species																									
	Sp. 11	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Sp. 12	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Sp. 13	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Sp. 14	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Sp. 15	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Sp. 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	2
	Sp. 21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4
	TOTAL	1	1	10	0	101	109	0	0	0	7	0	0	0	7	0	0	0	0	0	35	0	4	79	354

Table 3. Prevalence and mean intensity of ectoparasite infested on birds in Mount Sadong and Satang Besar Island.

	Ectoparasites	Mainland (N=30)				Island (N=23)			
		Infested host	Ectoparasites prevalence (%)	Number of ectoparasites	Mean intensity	Infested host	Ectoparasites prevalence (%)	Number of ectoparasites	Mean intensity
Lice	**Philopteridae**								
	Lipeurus sp.	2	6.67	3	1.50	0	0	0	0.00
	Philopteroides sp.	2	6.67	6	3.00	0	0	0	0.00
	Sp. 4	1	3.33	1	1.00	0	0	0	0.00
	Goniodidae								
	Goniodes sp.	1	3.33	1	1.00	0	0	0	0.00
Mites	**Dermanyssidae**								
	Dermanyssus sp.	1	3.33	1	1.00	0	0	0	0.00
	Proctophyllodidae								
	Pedanodectes. angustilobus	1	3.33	6	6.00	0	0	0	0.00
	Proctophyllodes. glandarinus	1	3.33	7	7.00	0	0	0	0.00
	Proctophyllodes sp.	1	3.33	3	3.00	1	4.35	6	6.00
	Pterodectes sp. 1	0	0	0	0.00	1	4.35	2	2.00
	Pterodectes sp. 2	0	0	0	0.00	1	4.35	3	3.00
	Pterodectes sp. 3	0	0	0	0.00	1	4.35	6	6.00
	Trouessartiidae								
	Trouessartia chionidis	3	10.00	156	52.00	4	17.39	80	20.00
	Trouessartia sp. 1	1	3.33	52	52.00	0	0	0	0.00
	Trouessartia sp. 2	0	0	0	0.00	1	4.35	15	15.00
	Unidentified species								
	Sp. 11	1	3.33	1	1.00	0	0	0	0.00
	Sp. 12	1	3.33	2	2.00	0	0	0	0.00
	Sp. 13	1	3.33	1	1.00	0	0	0	0.00
	Sp. 14	1	3.33	1	1.00	0	0	0	0.00
	Sp. 15	1	3.33	1	1.00	0	0	0	0.00
	Sp. 19	0	0	0	0.00	1	4.35	2	2.00
	Sp. 21	0	0	0	0.00	1	4.35	4	4.00
	Overall	10	33.33	242	24.2	4	17.39	118	29.5

chrysogenys) which were all belong to Order Passeriformes. Thus, it is possible for *Trouessartia chionidis* to be present in both habitats as their host available in both habitats.

However, they differed in the number of individuals of *Trouessartia chionidis* were observed from both habitats. Mount Sadong recorded 156 individuals of *Trouessartia chionidis* and Satang Besar Island while only 59 individuals of *Trouessartia chionidis* recorded. Previous study has found a poor parasite assemblage in the islands compared to the mainland (Barrientos *et al.,* 2014). There was general agreement about the reduced number of ectoparasites expected for island-dwelling and the density of host seems to be the factor (Barrientos *et al*., 2014). The number of ectoparasites is also influenced by body maintenance behaviour (Clayton, Koop, Harbison, Moyer & Bush, 2010). As for example, Roul roul (*Rollulus rouloul*) recorded the most ectoparasites species among the other host, but in lower number of ectoparasites individuals. This might due to their dusting behaviour (Clayton *et al.,* 2010). According to Van Liere (1992) and Clayton *et al.* (2010), dusting is a way to remove excess feather oil that can cause matting of plumage and also helpful in controlling ectoparasites by reducing feather lipids (food for some ectoparasite), directly dislodging ectoparasites and block ectoparasite's spiracles for breathing. Other adaptations and behaviours also might be helpful in controlling ectoparasites such as plumage barrier, feathers toxins, and nest maintenance behaviour (Clayton *et al*., 2010).

Satang Besar Island recorded a low prevalence (17.30%) compared to Mount Sadong (33.33%). A general low prevalence of ectoparasites in the island was agreed with works reporting the low prevalence of ectoparasites in island habitats by Hellgren, Križanauskienė, Hasselquist and Bensch (2011). Yet, other author has reported otherwise, the majority of the parasite species on the islands did not show a reduced prevalence of infestation compared to mainland sites (Paterson, 2012). Various hypotheses may account for the prevalence of avian ectoparasites in the mainland and island. Fromont, Morvilliers, Artois and Pontier (2001) stated that the mainland population often has higher directly transmitted parasites than island populations. This might due to the higher density of host in mainland (Barrientos *et al*., 2014; Stanko, Miklisová, de Bellocq, & Morand, 2002). As could be described the habitat of mainland in this study, Mount Sadong was a forest that was surrounded by fruits and pepper orchards that provide unlimited food sources to vertebrates. This type of vegetation provided a good habitat for birds (which proven by the higher number of bird individuals (N=30) captured compared to Satang Besar Island) and beneficial for ectoparasites to harbour their colony on the host. Whereas the absence of some species with low prevalence could be explained by the low sample size of the host on the island.

The low prevalence of ectoparasites of birds on the island may be due to host species available on the island or specifically due to degree of host preferences (Barrientos *et al*., 2014). Some of them used an array of those belonging to the same order or family (McCoy, Léger & Dietrich, 2013). The result from this study shows the infestation of ectoparasites in Satang Besar Island was lower than infestation in Mount Sadong. However, there was higher in mean intensity (29.5) than mainland (24.2) which indicates that a high number of ectoparasites tend to inhabit on an infected host in the island. Due to the low host available and high degree of host preference, the infestation of ectoparasites in the island was occurring only on White-rumped Shama, Olive-winged Bulbul and Pied Fantail which solely subjected to order Passeriformes.

Apart from that, ectoparasites prevalence might also be influenced by land size. This was supported by the previous study by Lindström, Foufopoulos, Pärn and Wikelski (2004) in which ectoparasite prevalence infestation increased with the land size. This seems applicable to this study since the island has a smaller land size than the mainland. Thus, smaller land size limits the dispersal ability of the ectoparasites (Plaisance, Rousset, Morand & Littlewood, 2008). Other than that, the increase of ectoparasite prevalence with the land size is most likely to be explained with the increasing of the avian host population size that inhabits the land (Lindström *et al.*, 2004). Therefore, an increased number of contacts between hosts will increase ectoparasite transmission in the particular land (Dobson & Carper 1996; Lindström *et al.*, 2004).

The prevalence of ectoparasites might depend on the nutritional status of the host (Tschirren, Bischoff, Saladin & Richner, 2007). In this study, there is a high infestation of feather mites on insectivores bird (Family Muscicapidae) and low infestation on nectarivores bird (Family Nectariidae). Feather mites are known to feed mainly on uropygial gland oil of birds (Galván *et al*., 2008). Uropygial gland secretion functions in maintaining the keratine in feathers, which keep the feathers in a good condition and flexible (Reynold, 2013; Stettenheim, 2000). Therefore, insectivores bird would have a larger uropygial gland than nectarivores bird for feathers maintenance as it is important for flight during predation (Reynold, 2013). Thus, the mites infestation is increasing with the size of the uropygial gland of the host (Galván *et al*., 2008).

Considering all ectoparasites species, *t*-test result indicated there was no significant difference in prevalence of the ectoparasitic fauna on birds between Mount Sadong and Satang Besar Island. The result in this study was expected to free from biases because the sampling effort was the same in both localities and the data was obtained with

standard methodologies, not from the other external sources. The indicated *t*-test result might due to the low sample size of the host. Insufficient sampling days may serve in the low host collection. More sampling days are needed to increase host captured.

The unidentified species of ectoparasites were due to inappropriate handling of the specimens during collection, sorting and mounting which cause damage to the crucial body part for identification. The unidentified species can only be identified as mites. Identification of parasites is a critical phase of this study. A sufficient illustration key is an important tool in the identification of ectoparasites. This study offers the first list of ectoparasitic fauna on birds in island population and also provides a preliminary data of the ectoparasitic fauna on birds in Sarawak. This study is important since ectoparasites infestation could affect the survival of birds and has the potential transmission of zoonotic disease.

CONCLUSION

In this study, Mount Sadong recorded higher in numerical prevalence of ectoparasites on bird than Satang Besar Island with were both dominated by *Trouessartia chionidis*. The prevalence of ectoparasites on bird is different according to the host density, degree of host preferences, land size, and nutritional status of the host. There was no significant difference between the prevalence of the ectoparasitic fauna on birds in the selected mainland and island of Sarawak. The result of this study might not be as comparable as other prevalence studies since it obtained low sample size of the host. A larger sample size of hosts is needed to support the study of ectoparasites prevalence. A sufficient key manual is crucial in conducting the ectoparasites study. This study provides a preliminary comparative data on ectoparasites in mainland and island of Sarawak. Besides, this data might be useful for the respective authority as an additional information for the conservation purposes of birds and its habitats. Thus, more studies on ectoparasites of birds should be conducted in the future since available data locally is still low.

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Work-Life Balance Among Expatriates

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ABSTRACT

There are 90000 professional expatriates working in Malaysia and the number is projected to increase year by year. This creates a need to explore work-life balance among expatriates in Malaysia. In this study, qualitative research method was used, and the data was collected using interview guide as the instrument. Actual data was collected from five (5) international lecturers in a public university in Sarawak. The data was analyzed using content analysis. The finding revealed that workload and family support are main contributors to work-life conflict among expatriates while receiving better salaries, meeting new people and experiencing culture are the work-life enrichment factors. Expatriates use general adjustment and interaction to adjust better with their new environment. Hence, it is recommended for organizations to support expatriates through relevant activities to assist them to achieve work-life balance in a foreign country.

Keyword: Expatriates, work-life balance, work-life conflict, work-life enrichment, strategies

INTRODUCTION

Today's increasingly global business world is resulting in more organizations to be competitive and making their employees to work outside their home countries as expatriates. Thus, in this current scenario, performing international work is a norm. Hence, expatriation is becoming the most ordinary decision in a way to meet the need to stay in markets even though it is challenging. In response to the advancing of technology and competitive market, the demand for expatriate employees is growing quickly as it becomes increasingly necessary for organizations to become globally accepted in short and long-term (Beechler & Woodward, 2009) Therefore, as Malaysia is gearing towards becoming an industrialized country from a developing one, it is opening its market towards globalization which will be beneficial for trade and services.

According to Bernama (2015), a bank survey has rated Malaysia as one of the top five (5) destinations for work satisfaction with 55 percent of expatriates saying they found their work more fulfilling since relocating. The inflow of expatriates into this country is to meet the demands of skilled and professional manpower in multiple fields and a continuity of inflow of expatriates in at least 10 years to come is expected. Hiring expatriates exposes Malaysia to the expertise of individuals from other countries. According to the statistics provided by Malaysia's Department of Immigration, the number of professional working expatriates residing in Malaysia is about 90, 000 (Department of Immigration, Malaysia, 2000). Generally, when an individual decides to become an expatriate, it does not only affect themselves but the overall situation. Even though expatriation is a challenging task, it is also undeniable that it has a positive outcome, which is work-life enrichment (Mäkelä & Suutari, 2011). Hence, the rationale of this research is to observe expatriate's work-life conflict and enrichment in work and family domain while performing overseas tasks and their strategies in adjustment to achieve work-life balance.

Work-life balance issue is usually a challenge for expatriates and their families. A positive or negative outcome in work-life balance is related to the roles of partner and families as well (Caligiuri *et al*., 1998). According to Greenhaus and Buetell (1985) work-life conflict happens when there are internal conflicts happening due to pressure from work and family domains. Role overload and interference are two components in work-life conflict (Greenhaus & Buetell, 1985). First, role overload can happen when the prescribed activities of multiple roles are too vast to be performed systematically due to limited time and energy. Interference occurs when there are difficulties in fulfilling the requirements of multiple roles with the presence of conflicting demands. This happens due to work and family activities that must be performed at the same time but in different physical locations (Greenhaus & Beutell, 2000). Enrichment is experienced when there are positive affects across work and private

life. Previous studies stated that positive experiences in one role will improve the quality of life in the other (Carlson *et al*., 2006). Enrichment may happen when for instance, the physical, social, capital and material resources acquired or developed in one role result in an improve performance and positively impact on another role (Greenhaus & Powell, 2006; Carlson *et al*., 2006). For example, a positive effect traversing from the personal life to the work domain could be found in a situation when an individual is enjoying a wonderful weekend with family and the positive mood being carried into a greater motivation to deal with the jobs and thus increase their effectiveness.

To successfully fulfil the foreign assignment, it is important for expatriates to adjust themselves to new cultural contexts (Huang, Chi, & Lawler, 2005). Thus, to be able to adapt well to the new environment, expatriates need to know general knowledge and importance of the new culture. For instance, the knowledge about the legal and economic systems, the rules of the foreign language, non-verbal communications as well as cultural values and religious beliefs will help the expatriates to study about the norms of the host nation and adjust better with the new environment. Adjustment is very important during expatriation because research has shown expatriates tend fail in their position if the expatriates do not adjust well to the host country (Caligiuri, 2000).

The specific objectives of this study are (1) to explore work-life conflict in work and family domain to achieve work-life balance among expatriates, (2) to identify the work-life enrichment in work and family domain to achieve work-life balance among expatriates and (3) to find out the strategies to achieve work-life balance among expatriates. The research questions are (1) What are the work-life conflict in work and family domains to achieve work-life balance among expatriates? (2) What are the work-life enrichment in work and family domains to achieve work-life balance among expatriates? (3) What are the strategies to achieve work-life balance among expatriates?

MATERIAL & METHOD

This study utilized the qualitative approach. By using this approach, it allowed the researcher to explore the area of perception and factors. This approach will also emphasize on the understanding of a subject, in this case, the informants by exploring deeply and thoroughly on their words, reactions and records. Information is gathered from the informants to be used to help the researcher to find out the result in order to achieve the objectives of this research. The biggest advantage of using qualitative approach is that it allows the researcher to dwell deeply into understanding the experiences of expatriates in achieving work life balance.

Population refers to a group of people, events or things that the researcher is desired to know in-depth their study (Sekaran, 2000). The population for this study is focused on professionals working at a public university in Sarawak. The sample of this study is informants of expatriates who are international lecturers from different faculties. In qualitative research, there is no specific population and sample to be used. According to Taylor and Bogdan (1984), it is difficult to determine how many people should be interviewed in a qualitative research. It is acceptable to have a population between 5 to 25 samples (Creswell, 1998). Several informants of foreign lecturers have been selected as the subjects for this study. They were chosen based on one (1) criteria which were length of service and their work experience. Based on these criteria, the informants who have worked as expatriates for a range of six (6) to twelve (12) months were selected. The sampling technique used was purposive sampling. Purposive sampling is a technique at which a researcher samples a respondent with a purpose in mind. This technique helps in reaching the targeted sample quickly. The information obtained undergo a pre-test to ensure it is met with the expectation of the researcher.

In this research, the main instrument in collecting data was interview guide. This method helps us to gain unlimited data, the opportunity to learn and explore the topic in more depth, and researchers can be a flexible in certain circumstances when carrying out similar methods (Rusli, Hasbee, Azman, Sopian, & Nur, 2014). In this interview guide, it consisted of four (4) sections in which section A was demographic questions. Section B consisted of warming up questions in order to build rapport between interviewer and interviewee while situational questions were asked to bring the interviewee into the research topic. Section C questions were asked to answer the research objectives. For section D, a closing question was asked to give the interviewee the opportunity to ask the interviewer any doubts about the research. The interview sessions were recorded for the purpose of this study.

Before the interviews, the researcher provided a letter of authorization from the faculty to conduct a study and the letter must be approved by the supervisor. Next, the researcher obtained approval from the targeted faculties and once it was approved, the researcher received a list of foreign lectures that have been targeted for this study. After that, the informants required confirmation through email asking the respondents' agreement to be interviewed. An appointment was made based on the suitability of both parties for the date, time and place to conduct the interview

session when the agreement was reached. A consent form which was signed by each informant was also provided. It is important that form consent forms are provided to ensure there are no misunderstandings that occur during and after the interview. Therefore, before the interview session, the informants were briefed about the research topic and the purpose of the study being conducted by the researcher. The researcher also tried to reach the balance between speaking and listening during this session. All the information and important data that had been delivered by the informants were recorded. Information obtained from interviews with informants represent the primary source while the secondary sources involved the use of documentary sources such as books which are related to the training method and the use of the internet as an information support.

In data analysis, it is divided into four (4) parts which are secondary or relational analysis, primary analysis, content analysis and thematic analysis. In this research, the data was analyzed based on the interviews that were conducted by using content analysis. Content analysis is a method of categorization of verbal or non-verbal data for the purpose of classification, summarization and tabulation. In content analysis, deductive approaches were used where the researcher transcribed word by word (verbatim) from the informant's content. There are five (5) steps in conducting content analysis. First step was organizing the data. At this stage, the researcher transcribed the data and classified them into two which are structure and familiarizing. Second step was identifying the framework. Next was sorting the data into a framework. The fourth step was using the framework for descriptive analysis. In content analysis, transcribing the data may take a long time where the researcher needed to listen carefully to the recording that was made and translate the conversation and then encode the information. The information obtained is used to explain the work-life balance among expatriates.

RESULTS

There are five (5) informants involved in this research. The informants were male and female which are currently working as international lecturers at a public university at Sarawak. They are from various ages, countries, background of education and departments. Table 1 shows the summary of the informants.

Table 1 Informants Demographic

Informants	Age	Gender	Religion	Marital status	Position	Length of service	Education	Origin
1	57	Male	Islam	Married	Associate Professor	12 years	PhD	India
2	52	Female	Islam	Married	Associate Professor	10 years	PhD	Indonesia
3	54	Male	Islam	Married	Associate Professor	10 years	PhD	Indonesia
4	39	Male	Islam	Married	Lecturer	3 years	Master	Bangladesh
5	32	Male	Islam	Married	Lecturer	5 years	Master	South Africa

Table 2 Identification on Work-Life Conflict Faced by The Expatriates In Family And Work Domain

No	Questions	Domain	Findings	Informants
1.	Have you experienced any conflict in balancing your roles at work since you started working as an expatriate?	Work	Workload	1,2,3,4,5
			Different Legislation	4
2.	Have you experienced any conflict in balancing your roles at home since you started working as an expatriate?	Family	Spouse and family support	1,2,3,4,5
			Childrearing responsibilities	4,5

Table 3 Identification on work-life enrichment faced by the expatriates in family and work domain.

No	Questions	Domain	Findings	Informants
1.	Have you experienced any enrichment in balancing your roles at work since you started working as an expatriate?	Work	Better salary	1,2
			Career advancement	3,4,5
2.	Have you experienced any enrichment in balancing your roles at home since you started working as an expatriate?	Family	New people and culture	1,2,3,4,5
			Better opportunities	4

Table 4 Identification on the strategies to achieve work-life balance among expatriates

No	Questions	Findings	Informants
1.	In your opinion, what are the strategies to achieve work-life balance among expatriates?	General adjustment	2,3
		Interaction adjustment	1,4,5

DISSCUSSION

From Table 2 above, in work domain, majority of the informants stated that workload is the main obstacle to achieve work-life balance. One of the informants mentioned that:

> *"Last semester was busy. Most of the time I'll be teaching and doing research. I came to my office at 7am and went back home at 9:30 pm. I was teaching at PPP, then running to teach SPSS at Faculty of Engineering then teaching Soft Skills here."*
>
> (Informant 1)

From this study, it shows that workload is one of the work-life conflict in expatriate's work domain. This finding is consistent with almost every study on work-life balance among expatriates (Shaffer *et al*., 2001), as long working hours and workload put a huge struggle on expatriates. In addition, the finding is also supported by a study by Shortland and Cummins (2007) where they stated that long working hours and lack of time for the family can cause physical or mental illness such as stress and emotional imbalance.

The above finding is also similar with a survey by ORC Worldwide (2007), which aimed at finding out the main stressors for expatriates. Workload and long working hours are the key areas in influencing work-life balance abroad. Two-thirds of expatriates reported they experienced longer working hours on an international assignment due to a higher number of responsibilities to meet their own working standards, and dealing with different cultural standards as to be successful in their career. Hence, a substantial amount of time is spent on business travels, telephone and conference calls, or meetings held outside normal business hours. Therefore, the expatriates reported feeling pressurized to work overtime because of their additional responsibilities compared with their local colleagues. Consequently, more than half of the expatriates felt overworked and overwhelmed.

Besides that, this study also found that different legislations also affect their work. One of the informants stated that:

> *"I can't drive my car to go to work since my license is not valid. The process to change it took approximately 3 months. I had to go to Kuala Lumpur since there's no embassy here in Sarawak."*
>
> (Informant 4)

This finding is similar with a previous study by Mäkelä and Suutari (2007). While working abroad, the work-life conflict was present due to different legislations, especially in the areas concerning maternity and annual leaves. This finding is consistent when one of their respondents decided to return to her home country due to birth of a baby. In short, workload and different legislations contribute to work-life conflict in work domain among expatriates.

In addition, the need to balance work and family life for a person working in their home country is somewhat difficult. But, for expatriates, when their work involves a family relocating to another country and having to adapt to new culture and customs, the negative impact on work–family balance is significant. Therefore, majority of the informants stated that lack of support from spouses and families are the contributing factor in work-life conflict among expatriates. As one of the informants stated that:

> *"It is quite challenging in the beginning. You know, when you come to the new country… you tried to build a network…making new friends. But I think it is more challenging when insufficient moral support is given. Especially from family members"*
>
> (Informant 1)

> *"Hmmm. Yes, I think my spouse is very supportive. I can say, if I don't get the support like how I received today, I will not be able to give my 100% commitment"*
>
> (Informant 2)

This finding is contradicting from the perspective of Segmentation theory, where it is suggested that both aspects of work and life are different entities and do not influence each other.. Spouse support is one of the important

predictors in determining the successfulness of the assignments (Grant-Vallone & Ensher, 2001). Cinamon (2006) stated that the low level of spousal support can raise a conflict in family domain. Thus, in a way to achieve work-life balance, these two domains cannot be separated as it will influence each other.

In addition, it is found very challenging to balance work and family when the working expatriates travel with their children. If a woman expatriate travels with a child or children, living in a new country, and far away from parents, families and peers appear to present considerable problems. As one of our informants said:

> *"Yes, I love my job. But since I travelled here with my wife and baby, we might experience tougher life compared to single expatriates."*
>
> (Informant 5)

Going on a foreign assignment is even much harder for expatriates with children. This goes hand in hand with Harris (2004) who has already stated that smaller children contribute more to a work family conflict than older ones.

> *"My children are now grown-ups. They are so independent in taking care of each other even my wife and I had to attend certain events until midnight"*
>
> (Informant 3)

For expatriates who have childrearing responsibilities, they find it difficult to find trustworthy childcare and good education. These two factors are often problematic for expatriates (Kollinger 2005a). As one of the informants stated that,

> *"I found myself so lucky that my wife is a full-time housewife. She is taking care of our baby here, so we don't have to look for a nanny for him."*
>
> (Informant 5)

In short, family and spouse are crucial and critical source of support for expatriates in dealing with work-related stress (Kraimer, Wayne & Jaworski 2001) to gain enrichment while expatriating. As defined by Morris and Madsen (2005), enrichment theory is referring to the degree to which experiences from skills, abilities and values (contributory sources) or mood and satisfaction (emotional sources) enrich the quality of the other domain. In short, if an expatriate enjoys their work, most probably they will gain the same satisfaction to family domain. In addition, Linehan and Scullion, (2001) highlighted the importance of the spouse's support as well as the appreciation of the partner's career for a successful assignment and may therefore take pressure from the couple and reduce negative stress. In short, spouse and family support and childrearing responsibility contribute to work-life conflict in family domain among expatriates.

From Table 3 above, the positive effect on work and family domain were identified when expatriates experience a better lifestyle and salary, are able develop their skills through international work and have a wider opportunity to express themselves and find ease in their personal life. The process in developing a more competitive individual for their career is a positive opportunity for expatriates compared to if they had stayed in their home countries. From the above analysis, in work domain, the researcher found that better salary can be the factor of having work-life enrichment. One of the informants mentioned that:

> "*Enrichment? Hurm… I must say a better salary."*
>
> (Informant 3)

Based on Greenhous and Powell model (2006), material resources such as better salary or gift, is one of the resources which can be classified as enrichment during expatriation. Besides, good quality housing, and opportunities to multitask are provided to an expatriate as solid resources in supporting expatriate's personal life spheres. The expatriates feel the benefit of being an expatriate is not only for themselves, but their families as well. One of the informants stated that:

> "*Currently, my daughter is pursuing her Master here. At my country, the university is quite far, and you need to travel 3 hours by trains.*"
>
> (Informant 1)

> *"I am quite busy since I am teaching and doing PhD at the same time"*
>
> (Informants 4)

In short, better salaries and career advancement for expatriates and their family can be seen as indications of work-life enrichment during expatriation. Other than that, in family domain, these international assignments provide expatriates and their families with opportunities to meet new people and get to know new countries and cultures. One of the informants mentioned that:

> "*There are a lot of festivals and celebration here in Malaysia. Last year, I experienced celebrating Hari Gawai with my friends."*
>
> (Informant 5)

> *"I enjoy staying in here. I learned a lot of new cultures. My family too. Food is the best part above all. There's always something new that I've never try before. Like Umai, Ambuyat and Tebaloi."*
>
> (Informants 4)

This study was similar with the previous research done by Makela and Suutari (2011) as they stated expatriation is a positive step in career advancement or as an adventure providing expatriates with opportunities to meet new people and get to know new countries and cultures. Next, according to Expat Explorer report, (2016), one of the top three reasons why expats choose to move to Malaysia are opportunities to improve their quality of life. More than half of expats in Malaysia agreed that the overall quality of life is better and less expensive than in their country of origin.

> *"The quality of my country is very different from here in Sarawak. There (home country), they like honking harshly on the road. Busy roads every day and the working place is so far away. I can't take taxi since it very expensive. But I can afford it here"*
>
> (Informants 5)

Ergo, from these findings, it shows that meeting new people and culture and better opportunities are the work-life enrichment in family domain among expatriates.

From Table 4 above, the researcher identified the strategies to achieve work-life balance among expatriates since it is not easy to start living in the new country. In order to enjoy the international assignments, expatriates need to handle the challenges well to make a better adjustment in their lifestyles. (Ward & Rana-Deuba, 2000; Zakaria, 2000). Drawing from Black *et al*. (1991) model, there are 3 models of adjustment which are general adjustment, interacting adjustment and work adjustment.

General adjustment is the degree of comfort with non-work factors like housing environment, foods, language, transport, etc. Interaction adjustment is the comfort achieved when dealing with local nationals in both work and non-work situations. Shaffer and Harrison (2001) stated that the effective development in interacting with the host nations is coming from a good adjustment. This study is similar with the previous research done by Barhem (2008) in which there is a connection with expatriated behavioral competence in social interaction and language fluency to adapt better with local people. As mentioned by one the informants:

> *"Basically, Bahasa Melayu and Bahasa Indonesia are quite same. That makes me and family members adjust better here with local people."*
>
> (Informant 2)

From this study, it is consistent with the previous studies where it is a natural response when people are interacting in their native language. Thus, if expatriates can speak a certain language used in the host country fluently, it will help to adjust better with the local nations. It is proven because a study done by Ramalu,, Rose, Uli, & Kumar, (2010). did mention that language proficiency helps expatriates facilitated their interaction adjustment in the host country.

Malaysia is well-known for its diversity and because of this, most expatriates find it interesting to settle down in Malaysia. However, because the majority of Malaysians are Malays and they practice Islam, non-Muslim expatriates may find it challenging to adapt with the Muslim practises. But, knowing there will be a cultural

difference between Malaysia and their home country, most of expatriates will ensure to respect the local customs and they find themselves be more sensitive towards the changes either in work or non-work environment. As Elashmawi (2001) stated, if an individual experiences problem to understand their own cultural values in effecting their behaviour, same cases will happen when they try to understand another person's behaviour. Thus, cultural clashes will happen. However, for informant 2, she found understanding Islamic religious restrictions is easier since she is a Muslim.

> *"Since I am a Muslim, it helps my family and me to adjust better here. There are a lot of masjid/mosque, activities for Muslim families and children as well as Islamic school."*
>
> (Informant 2)

> "*I feel just like home when celebrating Ramadhan in Malaysia. My family and I will go to nearby masjid at our housing area and performing the prayers. Same things we do at my country"*
>
> (Informant 5)

Adaption to live in a foreign nation such as housing, health care, and education facilities are known as general adjustment (Black and Stephens 1989). Besides, based on Bartol and Martin's (2000) cross-cultural management theory, most cases of expatriation will take 6 to 12 months to be able to make a better adjustment in a new country setting. Thus, a study by Fish (2005)) stated that, in order for the expatriates to be better accepted by the local nations, they need to blend well with the cultural differences and applying it within the role of an expatriate and the structure of organization. This may help the expatriates to gain better acceptance by the local employees. Thus, an alternative to which these expatriates can prepare themselves with these adjustments is through orientation. Orientation is crucial in improving the skills and positive behavior to prevent cultural shock during performing the assignment among expatriates. One of informants claimed that he had difficulties in terms of searching for Halal food in the host cultural environment.

> *"The first time I came here, I was quite shocked when there are non-halal and halal restaurants operating side by side at Desa Ilmu. Because of that, I think, orientation should be done for us to know, where to get halal food with a genuine environment that we preferred."*
>
> (Informant 5)

One of informants also stated that he was having difficulties asking about directions with the locals.

> '*I was having difficulties during asking for direction with the local. During that time, my family and I were in the lift to grab our dinner. I was asking which floor I should go to get to the restaurant right… But they just nodded and smiled.'*
>
> (Informant 4)

When an expat is relocated to a new environment, they will often face many challenges. A supportive orientation from the organization that explains Malaysian cultures, languages, food, housing etc, can be a tremendous support system and best practices to help expatriates to adjust better to avoid pitfalls and misunderstanding. As one informant said,

> "*Orientation or cultural training in group will help us to adjust better. Because in group, we will meet and interacting with other expatriates and making new friends. I always think it is a good idea"*
>
> (Informant 2)

Richardson and McKenna (2002) further confirm that orientation from the host organization is important in showing the support from the organization itself. Orientation provides some free spaces for expatriates to make a better adjustment during their international assignment or if not, expatriates will tend to repatriate prematurely.

CONCLUSION

This study has managed to gather information on the work- life balance among expatriates in Malaysia by using qualitative approach. Findings from this research acknowledge that expatriates in Malaysia face work-life conflict in handling workload and getting the support from their spouse and family. Better salaries and meeting new people and culture contribute to their work-life enrichment in work and family domain respectively. Moreover, expatriates found out that the use of general adjustment and interacting adjustment are helping them to adjust better in the new country. Thus, fundamental support and help from family, friends, organizations and HR practitioners are needed to assist expatriates to achieve work-life balance in a foreign country.

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Design and Development of a Life Insurance Mobile Application for Young Adults

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ABSTRACT

In this modern era, accidents could occur anywhere any time before prevention can be made. Life insurance could help lend a sum of money to reimburse the medical fees. But not everyone has life insurance, some people think that life insurance is a waste of money where they think people should save money at an early age and only pay when an actual accident occurs. This occurs in young adults too. Some young adults do not know the knowledge of life insurance. Therefore, this study is conducted to help young adults understand and provide the awareness of the importance of life insurance by creating a mobile application on Android Operating System using Android Studio. This system was created based on waterfall system development life cycle and evaluated using cooperative evaluation method. The mobile application can display and provide the knowledge of life insurance and calculate the suggested life insurance plan for the user. Five participants were randomly selected for cooperative evaluation. They are young adults age between 20 to 25 years old and have their own income. Out of those five participants, two of them like the mobile application while the other three participants suggested several improvements on the developed mobile application.

Keyword: Life insurance, mobile application, young adults

INTRODUCTION

Life insurance is an agreement between an insurance company with a client. It is a means of financing a person's health care expenses. The life insurance company will absorb the cash value, and your beneficiary will be paid the policy's death benefit (Marquand, 2012). For a set of time, life insurance will give protection to the client but at the same time, permanent insurance will provide a lifetime coverage to the client such as whole and universal life. We will never know when we will need life insurance as accidents come in the most unexpected ways. Payments for a term policy guarantee a specific benefit sum in the event of the client's death while the policy is still active. This means that term coverage works like a "parachute" to cover their family during the years in which an accident could occur (Lant, 2018). When a person is involved in an accident, their responsibilities to dependents will be interrupted. Life insurance can help the victim's family financially. There is broad public support for more government spending on childcare if that spending does not result in another unfunded entitlement that worsens the deficit (Whitehurst, 2017).

People can apply for life insurance from several life insurance company agents. There are many life insurances companies in Malaysia such as Takaful Ikhlas, Prudential and Kurnia Insurance. People can apply by visiting their website, go to their insurance centres or contact their own agents. Some life insurance agents even take the incentive to rent a space in most hospitals, clinics and city halls to promote life insurance to society. Life insurance fee comes in amounts which differ base on factors that will be considered on an application such as personal information, existing savings and insurance, liabilities and expected expenses and desired replacement income. Upon completing this application, the life insurance agent would suggest the amount of life insurance needed to cover any unfortunate events.

There are several problems that arise for young adults insurance coverage. The first is not every young adult in Malaysia have a life insurance plan. Statistically, older adults have a lower drop compared to younger adults in insurance coverage. In the year 2015, there is a drop of 5.6 percent for uninsured 26 years old adults and 1.9 percent drop for uninsured 64 years old adults (Barnett & Vornovitsky, 2016). The second is young adults do not appear to know which, where and how to apply for life insurance. As most young adults were not introduced to

life insurance since a younger age, they do not have the ability and capacity to figure out how to purchase a life insurance plan.

Several websites provided guidance on how life insurance work, but the content is too general as the information could be used for all ages. Younger adults need to find the details of life insurance plan that is suitable for their financial and health records. This includes the selection of the best life insurance plan, the amount of fees needed to be paid per month and what is the next step when there are accidents that require them to refer to life insurance that they subscribed. It is very common to see young adults with mobile devices in their hands. Unfortunately, there is no mobile application providing information regarding life insurance. This causes a need for a development of the local-based mobile application.

Hence, this study is to design and develop a life insurance mobile application with repetitive technique to assist young adults and connect them with life insurance, the knowledge of life insurance and the suggested life insurance plan. The insurance company could use the source code provided with the mobile application to customize and improve the mobile application to meet their own needs such as information and details about their life insurance plan. The evaluation conducted from this study can be used as a reference for the future developer on life insurance mobile application that meet the expectation of the young adults.

BACKGROUND

Importance of Life Insurance to Young Adults

The economic development of a country in the present-day has a major dependency on the insurance sector as its position in identifying the risk transfer of the community and provider of financial services to the individual and organisation (Ionescu, 2012).

According to Barnett and Vornovitsky (2016), having a regular doctor and receiving recommended preventive care is much likely in young adults that have life insurance coverage. 85% of insured young adults stated that they have a regular doctor and receive recommended preventive care. But at the same time, only 38% of them that have no life insurance coverage will do so. Uninsured group suffers in settling the medical bills and those with family can be saddled with thousands of dollars in medical debt caused by catastrophic illness and injury that happened to their family members.

Some young adults avoid or delay when they require medical attention because of the medical cost itself as they do not have full coverage in health insurance. The survey conducted by Barnett and Vornovitsky (2016) showed that the highest score rates of cost-related problems to get needed health care was experienced by uninsured young adults. In ten young adults, six of them were uninsured at the time the survey is conducted and 56% of them were insured but had been uninsured as there are cost related problems in accessing health care.

Mobile Application

In the last few years, the use of mobile devices had seen a drastic increase and had become more sophisticated. These devices allow users to accomplish a wide variety of tasks. The number of usability issues has become more prevalent as the result of the ease in the creation and distribution of mobile applications (Flood et al., 2012). The use of a wired information system infrastructure can be reduced with the existence of smartphones and laptop computers. The wireless devices allow tasks to be performed in many different contexts. Good mobility design should be achieved to meet user requirements (Huang, 2009; Gebauer, Tang, & Baimai, 2008).

The ADDIE model is one of the many popular instructional system design models. It includes five stages which include Analysis, Design, Development, Implementation, and Evaluation (Treser, 2015). There is no specific evaluation that is conducted on life insurance mobile application but there are several evaluations that had been done on various mobile applications. An empirical study based on a set of measures to evaluate the usability of mobile applications (Google Apps and Google Maps) running on different mobile operating systems, including Android, iOS and Symbian is proposed by Moumane, Idri and Abran (2016). The aim of their work is to evaluate empirically a framework that they have developed on the use of the Software Quality Standard ISO 9126 in mobile environments, especially on the usability characteristics. However, for the application developed in this study, a rapid evaluation method is introduced to evaluate the prototype of the developed application before making any changes to the whole design of the life insurance application. Cooperative evaluation method is selected in this study because it is expected to gain the feedback from the user in a short amount of time before a fully operational system is developed.

Life Insurance in Electronic Version

Meanwhile, there are only two life *insurance* mobile applications that had been developed in Malaysia which are 'EZTakaful'(https://www.eztakaful.com.my/) and 'EtiqaHealthCare' (http://www.etiqa.com.my/en/healthcare). For EZTakaful, the mobile application provides information in which users can choose plans they wish to apply. Users can look at plans they wish to purchase and calculate total monthly payment. For EtiqaHealthCare mobile application, the user must apply for the life insurance first before they can have access to the features in the mobile application. Both of these mobile applications do not focus specifically on young adults; it does not highlight the importance of life insurance on insurance buyers especially young adults. The mobile application is more focused on the buying of insurance plan and why that certain plan is good for the client. The mobile application is suitable for post-application insurance policy users as the features provided by the mobile application are focused more on the policy taken and health records. In this study, the knowledge of the life insurance is highlighted to ensure that clients especially young adults can understand the importance of life insurance before making any plan or consideration to buy a life insurance plan.

METHOD

The System Development Life Cycle (SDLC) method is used in this study. The method includes initial investigation, requirements definition, coding and testing, system design, implementation, and evaluation. This SDLC method is used as a guiding framework because it is ideal for supporting less experienced project teams and project managers, or project teams whose composition fluctuates (Wikipedia, June 2017). Figure 1 shows the phases of the waterfall SDLC.

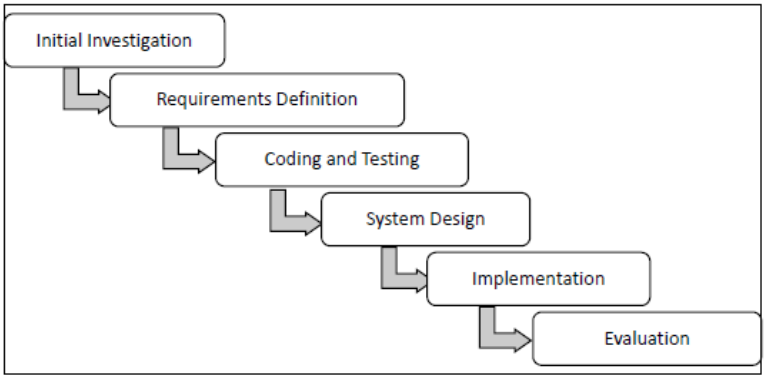

Figure 1. The six stages of Waterfall SDLC model

Initial Investigation

In the initial investigation phase, all possible items that the system requires are listed such as problems that need to be solved, target audiences and tasks that will be implemented. For the problem that needs to be solved, a research is executed to identify if there is any study on the development of life insurance mobile application. The knowledge related to life insurance and its plan is also searched to be included in the mobile application. For the target audience, the characteristics and other details of the target users are listed to fit the specifications and functions that will be included in the mobile application to solve problems. The task to be implemented is also identified including the task and activities target users will be completing to determine if the solution is suitable for the problem. Several types of research are conducted to find the statistics of the uninsured people which was obtained from the internet and interviews with some life insurance agents.

Requirements

The requirements definition has been decided after all initial investigation had been done. The mobile application development platform will be Android Studio. This platform is decided based on the difficulties to understand the process of the development. Android studio could easily have adapted to the world of android app development. It is designed particularly for Android development and to accelerate the Android development process. In this phase, some development software has been tried such as Unity before choosing Android Studio as the development software.

Process Flow

To develop this mobile application system, several processes and flows need to be followed to ensure the system develop smoothly. For this system, the interface for each screen will be created first. This will give the developer a much more visual picture before linking the pages with each other. After all connections between pages are

established, a simple testing would be done on the software itself before it can be rendered and debugged into an APK file to be installed in an actual mobile phone. This phase will focus on the development flow of the mobile application as seen in Figure 2.

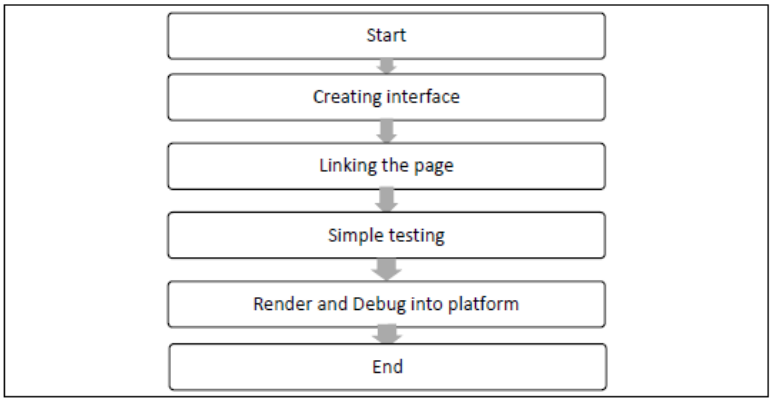

Figure 2. System process flow

Coding, Testing, and System Design

Coding, testing, system design and implementation can be combined as one stage which is the development of the mobile application system. The system contains three parts and functions. The first and foremost is the life insurance information details. This part contains all about life insurance that is needed by the young adults such as what is life insurance, which life insurance plan is best to fulfil one's needs, when is the time to use or claim life insurance, how to apply for life insurance and where to find life insurance agents. The next part is a calculator to calculate the range of life insurance coverage users should take. The last function is the frequently asked questions (FAQ). Most questions related to life insurance will be displayed here. Figure 3 shows the information structure of the suggested life insurance mobile application.

Implementation

Upon completion of the system, it will be implemented on an Android device as the mobile application's first prototype. The bar of minimum requirements for the system will be set as low as possible. The Android platform version is set to android 4.2 (JellyBean). The main reason this version is selected is that most mobile devices in Malaysia can be upgraded to JellyBean on the purchase as it has a 96% cumulative distribution. This can give everyone the opportunity to use the mobile application although their mobile devices may not be among the high-end devices.

Evaluation

Lastly, an evaluation will be conducted to evaluate the life insurance mobile application. The evaluation is executed using the cooperative evaluation method. Cooperative evaluation is a method or process to collect feedback from users regarding the system to find problems.

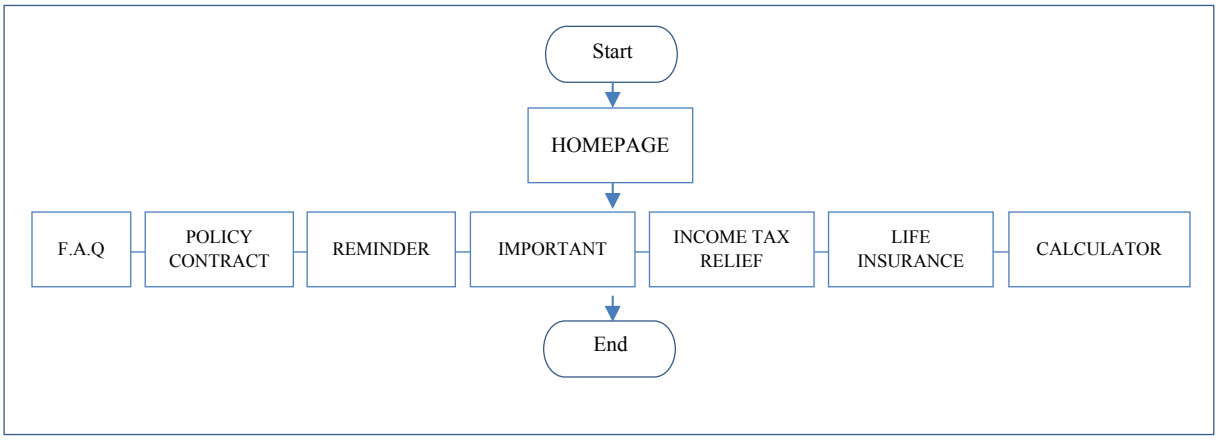

Figure 3. The structure of the mobile application upon completion

RESULTS

Life Insurance Mobile Application

The first and foremost visual display that the user will see when they open the mobile application is the homepage screen or main menu. This page connects every sub-function and sub-section available in the mobile application, namely knowledge of life insurance and life insurance calculator. Figure 4 shows the homepage of the mobile application life insurance knowledge section on the Android device. Another part of the life insurance knowledge section is the FAQ section, this part consists of all questions that are usually asked by clients. The system displayed each question with its respective answer sorted from the most asked question with the highest frequency of the most asked questions to the lowest frequency.

The life insurance calculator has been included in the system. The system calculates the recommended life insurance plan that users should buy. The calculator is divided into three parts: current income, liabilities and income replacement. In the current income section, the system collects input from users focusing on their income revenue. This includes their current savings, investments and existing coverage in case the user is already under any health insurance program held by their employer or others. The system will then calculate the total value of that three values, giving the value of total income. Figure 5 shows the interface of the life insurance mobile application calculator section for the user's current savings and the liabilities and expected expenses. The system will ask the user about their desired replacement income. This includes the user's current annual income, the number of years for the user to replace their income, the user's survivors desired income after user can no longer work and the duration for those survivors to obtain money aid. Finally, the system will calculate the suggested instant savings users should have in case they were involved in accidents. This value also indicates the plan that is suitable for users.

Life Insurance Mobile Application Evaluation

Five participants will be randomly selected for this evaluation. There are several criteria to be fulfilled in the selection of participants. The first and foremost is that participants must be in the age range between 20 to 25 years old. The participants should not have any knowledge on life insurance, and earn a monthly income (i.e., salary). Each participant will be asked to complete the same set of tasks in a specific time frame. After completing the task, the participants will be asked about their opinions on the life insurance mobile application. The common question asked are as follows; "How do you feel when you see this page?" and "Do you have any questions when you finish reading this page?". This is to ensure that the participants would always provide enough feedback. As this research promise anonymity to the participants, the gender will be considered as neutral and will be referred as "the participant" in this study.

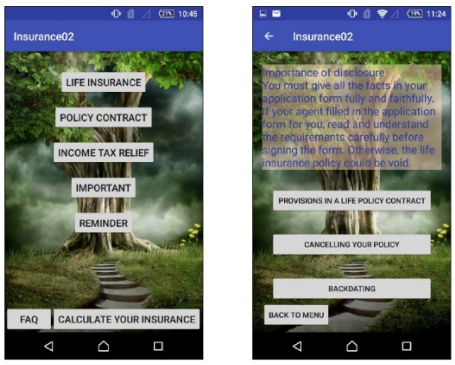

Figure 4. Homepage and content of the mobile application

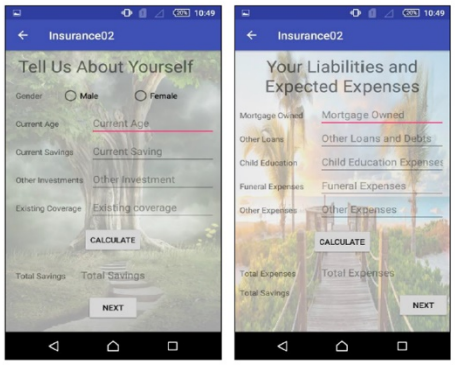

Figure 5. The interface of the life insurance mobile application calculator

User testing with participant 1. For the first user, the participant claims that the mobile application is easy to understand. The terms and information in it is very simple and understandable. The participant also said that the design is catchy to the eye due to the image of the background, the colour, and size of the font presented in the mobile application. Upon finishing using the mobile application, the participant suggested that the mobile application should be created in bilingual or provide a glossary for the user who may not understand the language. The participant also suggested creating more interactable functions between the user and the mobile application.

User testing with participant 2. For the second user, the participant claims the knowledge in the mobile application is easy to understand. The participant suggested that the background of the mobile application and the font colour need to be changed as the current design is glaring to the participant's eyes.

User testing with participant 3. For the third user, the participant could not understand the questions given in the calculator, this is due to some unclear terms stated in the calculator such as "existing coverage" which means existing life insurance coverage. The participants also complained that the background is unsuitable for the theme of life insurance and asked to change the colour of the font to be darker.

User testing with participant 4. For the fourth user, the participant was confused with some terms in the mobile application such as the annual or monthly terms used in the calculator. The participant thought that the question asked for monthly salary, but the question was asking for the annual salary. The user also did not know what the activity flow for this mobile application was when starting it as there was no arrow or indicators where to click first. For the design of the mobile application, the participant suggested using only one background instead of two. The participant agrees that the background is already suitable but preferably to be consistent with only one background. The participant also suggested using a darker font if the background is lighter.

User testing with participant 5. For the fifth user, the participant does not see the flow of the application. The participant suggested that the mobile application should provide arrows or numbers for the users to know where to focus first. Next, the participant is confused with the back-button function. The participant thought that the back button provided in the mobile application is different from the back button provided by the smartphone itself. The participant suggested that the mobile application to be designed with easy terms such as the problem with the "monthly or annual salary", the participant suggested that the terms should always use the easy term which is 'monthly' so the user does not have to think hard how much their annual salary is. The participant also suggests creating a page with a narrower choice which can be seen in the 'Policy Contract' section of the mobile application, the list of policy contract provided is displayed on one page. The participant suggested that the first page should only provide the name of the policy contract which will bring the user to a specific page explaining the policy contract. The participant also complained of not knowing the progress of the mobile application as there is no title for each page.

DISCUSSION AND CONCLUSION

Discussion

To create awareness among young adults on the importance of life insurance in their daily life, a mobile application which impart knowledge of life insurance is created. Statistics suggest that a majority of young adults today do not have a life insurance plan. Although there are multiple websites that provide guidance on how life insurance work, the content is still too general. This mobile application aspires to overcome that problem by imparting knowledge of life insurance to help young adults understand how life insurance works generally. This is especially pertinent as handphones have become popular and almost everyone owns a handphone.

The creation of this mobile application was based on a waterfall lifecycle which included the initial investigation, requirements definition, coding and testing, system design, implementation, and evaluation. To ensure that awareness of the need of life insurance is highlighted among young adults, the content of the mobile application contain knowledge of life insurance including the type of policy contract, tax relief, and life insurance calculator. The calculator function is important feature as today's young adults could not see why they need to purchase life insurance. So, by using the life insurance calculator it will give the user a simple view on how much they should have in their savings to protect their love ones. The evaluation of this mobile application was also conducted among five participants using cooperative evaluation where two participants liked the mobile application and three participants gave some comments on the design of the mobile application.

Conclusion

The aim of this study is to create a life insurance mobile application to help equip young adults with knowledge of life insurance and its contents. The appropriate apps development tool is also selected which is Android Studio which implement the APK file and is debugged on an Android Operating System. This life insurance mobile application is created with a repetitive technique to assist young adults and connect them with life insurance, the knowledge of life insurance and the suggested life insurance plan. Lastly, a cooperative evaluation method is applied to evaluate the life insurance mobile application.

Future Study

Future studies are expected to help improve the life insurance mobile application by creating the mobile application in bilingual with assistance in the glossary. The design of the interface of the mobile application also needs to be reconstructed as some users do not like the colour and the background image. The terms and language of the mobile application also need to be refined to give clearer terms to the users. Lastly, the mobile application is expected to be developed on the Intelligent Operating System (IOS) to expand the user coverage.

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Ironi Dalam Bahasa Kiasan Punjabi: Analisis Semantik Inkuisitif

Irony in Punjabi Language: An Inquisitive Semantic Analysis

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ABSTRAK

Bahasa merupakan satu medium penyampaian pelbagai hasrat yang berkesan. Kajian ini mengkaji bahasa kiasan Punjabi yang digunakan oleh masyarakat Sikh di Malaysia. Objektif kajian adalah untuk mengenal pasti unsur haiwan dalam bahasa kiasan Punjabi. Kajian ini berbentuk kualitatif. Lima bahasa kiasan yang berunsurkan haiwan yang dikutip melalui kaedah temu bual dianalisis berdasarkan pendekatan semantik inkuisitif Nor Hashimah Jalaluddin (2014). Hasil kajian mendapati bahawa ada beberapa nasihat melalui bahasa kiasan yang memasukkan unsur haiwan dalam ujarannya. Didapati makna pada peringkat permukaan semantik, cuma memaparkan makna selapis sahaja. Dengan pendekatan semantik inkuisitif, dapatan kajian menunjukkan penyebutan unsur haiwan dalam ujaran bahasa kiasan masyarakat Punjabi berbaur ironi dan mempunyai falsafah kehidupan masyarakat ini. Setiap bahasa kiasan yang dianalisis memaparkan makna berlapis yang perlu dikupas dengan mengaitkan makna selapis berkenaan dengan kehidupan masyarakat Punjabi secara keseluruhan yang merangkumi aspek norma dan pemikiran mereka serta tindak tanduk kehidupan yang mereka harungi seharian. Kajian juga mendapati bahawa ujaran kiasan ini dicipta berdasarkan pengamatan terhadap persekitaran dan alam pemikiran mereka yang berbentuk abstrak dan memerlukan pengamatan teliti. Akhirnya, didapati bahawa pendekatan semantik inkuisitif yang menggabungjalinkan data, teori, kognitif, falsafah dan akal budi sesebuah masyarakat dapat memaparkan makna sebenar yang hendak disampaikan menerusi bahasa kiasan ini. Dengan kaedah semantik skrip, makna selapis mudah diketahui. Kemudian dengan semantik resonans, pemetaan makna selapis ini dikaitkan dengan kognitif penutur dan akhirnya dengan analisis semantik inkuisitif, makna yang lebih deskriptif dapat dijelmakan. Kaitan makna dapat dikonstruk satu per satu dengan tiga peringkat analisis dalam semantik inkuisitif. Makna yang diperoleh lebih tinggi kesahannya.

Kata kunci: bahasa kiasan, masyarakat Punjabi, falsafah dan akal budi, semantik, semantik inkuisitif.

ABSTRACT

Language is a medium of delivering variety of effective desires. This study examines the Punjabi language used by the Sikhs in Malaysia. The objective of the study is to identify animal elements in the Punjabi figurative language. This study is qualitative. The five animal figurative languages cited by the interview method were analyzed based on the inquisitive semantic approach Nor Hashimah Jalaluddin (2014). The findings suggest that there are some advice through figurative language that incorporates animal elements in his speech. The meanings of the semantic surface mean that it only shows the meaning of a layer. With the inquisitive semantic approach, the findings of the study show the mention of animal elements in the speech of the folklore language of the societal society mixed with irony and have the philosophy of the life of this society. Each figurative language analyzed illustrates the layered meaning that needs to be peered by linking the meanings of the society to the whole of society as well as aspects of their norms and thoughts as well as the actions of their daily life. Studies have also found that these metaphysical utterances are based on observations of their abstract-shaped environment and nature and require careful observation. Finally, it is found that the inquisitive semantic approach that combines the data, theories, the cognition and the philosophy and the minds of a society can reveal the true meaning to be conveyed through this metaphorical language. With the semantics of the script, the meaning of the simplest is known. Then with the semantics of resonance, the mapping of the meaning of this layer is associated with the cognitive of the speaker and ultimately with the inquisitive semantic analysis, a more descriptive meaning can be manifested. The connotation of the meaning can be constructed one by one with three levels of analysis in semantic incuity. The meanings obtained are higher in legality.

Keywords: Figurative languages, Punjabi community, philosophy, mind, semantic, inquisitive semantic.

PENGENALAN

Hubungan bahasa dan pemikiran telah banyak dikaji oleh pengkaji-pengkaji bahasa yang meliputi hal-hal yang berkaitan bidang linguistik, khususnya semantik. Dalam bidang semantik, antara isu yang dibangkitkan berkaitan aspek ini ialah makna implisit yang terdapat dalam bahasa bermetafora. Pelbagai pendekatan semantik dan pragmatik yang mengkaji makna secara lebih tepat digunakan. Misalnya kajian yang dilakukan oleh Rogayah (2012), Rozaimah Rashidin & Nor Hashimah Jalaluddin (2015), Suziana Mat Saad, Nor Hashimah Jalaluddin, & Imran-Ho Abdullah (2017*),* dan Mary Fatimah Subet (2018). Dalam masyarakat Punjabi, bahasa bermetafora ini dapat diamati dalam bentuk bahasa kiasan atau nama lain dalam bahasa Punjabi ialah *muhavare.* Namun, fokus pengkaji dalam kajian ini ialah cabang ilmu semantik yang mengkaji maksud di sebalik sesuatu ayat dalam satu bahasa yang tertentu. Menurut Anis Kurniawan (2015), "semantik adalah cabang linguistik yang mempelajari makna yang terkandung dalam bahasa, kode, atau jenis lain dari representasi. Dengan kata lain, semantik ialah kajian tentang makna sesuatu perkataan atau ayat. "Semantik merupakan kajian makna yang boleh didampingi oleh mana-mana bidang dalam memperjelaskan lagi tabii bahasa yang dikaji" (Nor Hashimah Jalaluddin, 2009). Kajian bahasa kiasan seperti peribahasa dan simpulan bahasa sering menjadi tumpuan utama dalam kajian semantik.

Dalam kajian ini pengkaji akan memfokuskan kiasan yang bersifat ironi. Menurut Fauzi Rahman (2011), ironi ialah satu pengucapan yang dituturkan dengan mempunyai makna kebalikannya. Ironi yang membawa maksud sindiran akan dikaji dalam kiasan Bahasa Punjabi yang digunakan oleh orang Punjabi dengan menggunakan unsur haiwan. Ironi ini akan dikaji dengan memperlihatkan teori semantik inkuisitif yang diasaskan oleh Nor Hashimah Jalaluddin (2014) dalam mengupas akal budi yang terdapat dalam pemikiran orang Punjabi ketika menuturkan bahasa kiasan tersebut. Kajian ini adalah untuk mengkaji unsur haiwan dalam bahasa kiasan Punjabi yang bersifat ironi melalui kaca mata semantik inkuisitif dalam memperlihatkan akal budi orang Punjabi. Objektif utama kajian ini adalah untuk mengkaji bahasa kiasan Punjabi yang bersifat ironi iaitu sindiran, berunsurkan haiwan dalam menghubungkaitkan semantik inkuisitif dengan menunjukkan akal budi orang Punjabi. Objektif khusus dalam kajian pengkaji adalah untuk mengenal pasti dan menyenaraikan bahasa kiasan dalam bahasa Punjabi yang mengandungi unsur haiwan, menganalisis bahasa kiasan Punjabi yang mempunyai unsur haiwan dengan pendekatan semantik melalui tahap semantik skrip, semantik resonans dan semantik inkuisitif, dan menghubungkaitkan makna bahasa kiasan Punjabi yang mengandungi unsur haiwan dengan akal budi dan falsafah masyarakat Punjabi. Ada beberapa kajian yang terkini yang mengkaji kewujudan haiwan dalam kajian mereka misalnya kajian Suriati Zakaria dan Nor Hashimah Jalaluddin (2016) yang menyentuh spesies haiwan kera dalam cerita klasik Melayu, iaitu siamang putih. Namun, kajian ini tidak melihat kera itu secara tuntas kerana tumpuan kajian ini ialah melihat konsep ruang dalam Hikayat Anggun Che Tunggal.

DATA DAN METODOLOGI

Kajian ini ialah kajian kualitatif, iaitu data dikumpul melalui hasil temu bual dengan informan berbangsa Punjabi. Tiga orang informan ditemu bual untuk mendapatkan data kiasan dalam Bahasa Punjabi yang berunsurkan haiwan. Kesemua informan tersebut merupakan orang Sikh yang berasal dari Malaysia. Masing-masing informan mempunyai taraf pendidikan yang berbeza. Namun, bagi mencungkil lagi makna kiasan dengan lebih mendalam, pengkaji hanya menggunakan tiga orang informan. Salah seorang informan mempunyai taraf pendidikan menengah atas iaitu tingkatan 5, serta mempunyai pengetahuan yang mendalam tentang bahasa Punjabi kerana individu tersebut yang berumur lingkungan 70-80 tahun. Seorang lagi informan merupakan paderi di Gurdwara dan mempunyai banyak pengetahuan tentang agama Sikh serta bahasa kiasan Punjabi. Seorang lagi informan merupakan individu yang berasal dari India serta mempunyai pemahaman yang lebih mengenai bahasa kiasan Punjabi. Perbezaan taraf pendidikan serta kefahaman informan dalam kiasan Punjabi dapat membantu pengkaji membezakan nilai kefahaman sekali gus mendapat data yang sahih dalam penggunaan unsur haiwan bagi kiasan Punjabi.Hal ini kerana menurut Mohd Majid Konting (2005), pemboleh ubah-pemboleh ubah (dalam konteks kajian ini melibatkan latar belakang informan yang pelbagai) seperti jantina, taraf pendidikan, pendapatan, tempat tinggal dan sebagainya telah sedia wujud dan penyelidik tidak boleh mengawal dan memanipulasi pemboleh ubah-pemboleh ubah ini semata-mata untuk memenuhi kehendak kajian. Nilai pemboleh ubah-pemboleh ubah ini adalah berbeza antara satu sama lain, dan juga berbeza antara individu.

Oleh itu, kajian ini berpendapat perbezaan taraf pendidikan serta kefahaman informan akan membolehkan penyelidik mendapat pelbagai maklumat yang berbeza untuk kedapatan kajian data yang lebih sahih. Data sahih yang dimaksudkan ini ialah data asli bahasa kiasan yang dikutip daripada temu bual dengan informan tadi dan data ini seterusnya dapat diuji kesahannya dengan pendekatan semantik inkuisitif yang diaplikasikan dalam kajian ini. Hal ini kerana menurut Othman Mohamed (2001), penyelidik akan menggunakan analisis data dalam penyelidikannya bagi membuat sesuatu kesimpulan dan perakuan sebagai hasil penyelidikan. Oleh itu, kajian ini perlu kepada data yang sahih yang dikutip secara langsung daripada informan yang mewakili masyrakat yang mendokong bahasa kiasan Punjabi ini. Data yang dikutip ialah data mentah yang asli kerana daripada penelitian

terhadap kajian-kajian lepas, didapati bahawa tiada dokumentasi dilakukan terhadap bahasa kiasan Punjabi. Pendekatan semantik inkuisitif Nor Hashimah Jalaluddin (2014) diaplikasi dalam kajian ini, iaitu mengupas maksud sesuatu kiasan melalui tiga tahap. Tiga tahap yang dimaksudkan ialah semantik skrip, semantik resonans dan semantik inkuisitif. Tahap semantik skrip cuma mengemukakan maksud bagi setiap perkataan dalam kiasan secara harfiah. Tahap semantik resonans pula mengetengahkan analisis data dengan teori yang dikaitkan dengan tahap kognitif di sebalik penciptaan atau penggunaan kiasan tersebut, sementara pada tahap semantik inkuisitif, analisis makna menjangkau lebih jauh lagi dengan mengaitkan makna yang diperoleh pada dua tahap terawal tadi dengan mengaitkannya pula dengan falsafah dan akal budi masyarakat Punjabi. Maka tiga tahap analisis ini akan dapat memperlihatkan maksud di sebalik setiap haiwan yang digunakan dalam kiasan tersebut. Dalam kajian ini sebanyak 25 kiasan telah dikumpul. Menurut Syed Arabi Aidid (1992), dalam Muhammad Fauzi Jumingan (2003), pemilihan sampel yang terlalu banyak tidak semestinya melambangkan ketepatan dapatan yang diingini. Dalam kajian ini pengkaji memfokus kepada kiasan yang berunsur ironi sahaja dan kesemua 25 data tersebut menepati kehendak pengkaji. Namun untuk keperluan kertas kerja ini, lima data sahaja akan dibincangkan berdasarkan tiga tahap analisis semantik inkuisitif iaitu semantik skrip, semantik resonans dan semantik inkuisitif.

ANALISIS DAN PERBINCANGAN

Tahap pertama analisis data di atas dilakukan pada peringkat semantik skrip. Dari segi makna skripnya, dalam kiasan *Meri billi menu meow* sepertia pada Jadual 1membawa maksud bahawa individu X telah banyak memberi ilmu atau membantu individu Y, kemudian individu Y pula yang menggunakan segala ilmu itu terhadap individu X. Ilmu dalam kiasan ini bersifat luas. Ilmu ini bukan sekadar pengetahuan tetapi juga termasuk nasihat atau pengalaman yang dilalui oleh seseorang individu.

Jadual 1. Semantik krip kiasan *Meri billi menu meow*

Kiasan Punjabi	*meri*	*billi*	*menu*	*meow*
Terjemahan langsung	Kepunyaan saya	kucing	saya	mengeow

Terjemahan gramatis : **Kucing** saya mengeow saya.
Makna : individu X mengajar balik apa yang diajar oleh individu Y sebelumnya.

Setelah makna skrip diperoleh, tahap analisis seterusnya ialah analisis peringkat resonans. Tahap ini memperlihatkan peranan kognitif mengambil fokus interpretasi. Mengapa haiwan kucing (*billi)* yang digunakan? Secara biologinya, seekor kucing mempunyai penglihatan serta pendengaran yang sangat tajam jika ingin dibandingkan dengan haiwan lain terutamanya anjing (Effendi Cacang & Budiana, 2004). Dengan penglihatan yang tajam seeokor kucing boleh melihat sesuatu tindakan mahupun sesuatu perlakuan dan dapat menangkap maksudnya dengan cekap. Selain itu, bersama-sama penglihatan, pendengaran seekor kucing yang tajam juga membantu kucing untuk memahami sesuatu yang diajar. Dengan kombinasi pendengaran dan penglihatan yang mantap, seekor kucing boleh mengadaptasi atau menghadam sesuatu maksud atau ilmu yang ingin disampaikan oleh sesiapa. Sifat kucing yang sangat menyenangkan juga mudah untuk mengajar mereka serta sifat mereka yang sangat tenang memudahkan seseorang untuk mendekati kucing. Namun, di sebalik sifat-sifat positif seekor kucing terselit juga sifatnya yang negatif, iaitu seekor kucing mempunyai sifat yang agak memilih. Jika seekor kucing mudah bergaul dengan mesra, ia boleh menjadi sahabat manusia tetapi jika berlaku disebaliknya, ia akan menimbulkan masalah (Effendi Cacang & N.S. Budiana, 2004). Sifat-sifat yang dinyatakan ini dapat dikaitkan dengan kiasan tersebut; dengan penglihatan dan pendengaran yang tajam, seekor kucing boleh belajar dengan pantas tetapi jika kucing itu mengalami kesukaran untuk bergaul, kucing itu juga boleh bertindak negatif dengan menggunakan semula ilmu yang dipelajari terhadap mangsa.

Setelah tahap makna skrip dan resonans dirungkai, falsafah serta akal budi masyarakat yang mencipta kiasan ini pula diselongkar. Hal ini demikian, mesti ada alasan kukuh di sebalik penciptaan bahasa kiasan ini yang memaparkan penggunaan unsur haiwan. Analisis peringkat semantik inkuisitif pula mengambil tempatnya. Melihat kepada akal budi dan falsafah dalam masyarakat Punjabi, menurut informan (Satwan Kaur, komunikasi lisan, November 3, 2017), kisah seekor kucing merupakan satu cerita rakyat dalam masyrakat Sikh. Kucing merupakan seekor binatang yang bijak kerana kucing mengajar singa segala ilmu yang harus ada pada seekor kucing. Jadi, kucing mengajar singa cara memburu, mengejar mahupun cara menyerang. Selepas mendapat segala ilmu tersebut, singa mula menunjuk belangnya dan cuba menyerang kucing itu. Namun, kucing bertindak bijak dengan memanjat pokok. Singa terpinga-pinga dan bertanya kepada si kucing mengapa tidak mengajarnya memanjat pokok. Jawab si kucing, kerana jika diajarnya segala ilmu, singa pula akan menelannya. Oleh itu, kucing hanya mengajar beberapa perkara kerana tidak mahu apa yang diajarnya memakan dirinya semula suatu hari nanti.

Jadi, kiasan *meri billi menu meow* digunakan oleh masyarakat Punjabi dalam menyindir sesiapa sahaja yang cuba melawan pengajarnya dengan niat yang kurang baik.

Data seterusnya memperlihatkan kiasan yang menghasilkan makna harfiah tentang seekor anjing (kutta) akan sentiasa mengekalkan sifatnya sama ada yang positif atau negatif kerana anjing sering kali diberi gelaran seekor haiwan yang setia. Kesetiaan dapat dilihat apabila anjing patuh dengan arahan tuannya dan menjaga keselamatan tuannya. Anjing juga mudah mengenali insan yang baik dan jahat melalui derianya, namun terdapat juga anjing liar yang boleh mengancam nyawa (Horowitz, 2009).

Bagi analisis peringkat resonans seperti di dalam kiasan ini, pemikiran yang dapat dilihat ialah dengan sifat manusia yang kejam atau jahat dikaitkan dengan ekor anjing (*kuttey dhi pooch*) kerana ekor anjing tidak pernah lurus dan sentiasa bengkok atau serong. Begitu juga dengan sifat manusia yang melakukan perbuatan yang serong. Jika seseorang sudah terlibat dengan satu perbuatan jahat, perlakuan itu akan menjadi tabiat sehingga menyebabkan kesukaran untuk seseorang itu berubah. Situasi ini dapat dikaitkan dengan kiasan seperti dalam Jadual 2,, iaitu seorang insan yang mempunyai sifat yang buruk atau tabiat yang sukar untuk diubah, sering dikaitkan dengan ekor anjing yang juga tidak pernah menjadi lurus.

Peringkat inkuisitif pula memunculkan persoalan ini. Mengapa anjing pula yang dikaitkan? Bukan semua anjing baik dan sentiasa menjaga tuannya, malah terdapat juga anjing yang mempunyai sifat yang ganas dan boleh menyerang manusia. Oleh itu, sifat anjing yang buas serta manusia yang mempunyai tabiat buruk yang tidak boleh berubah dapat dikaitkan dengan kiasan tersebut. Menurut informan (Gurbir Singh, komunikasi lisan, October 26, 2017), perkaitan tersebut dapat dihubungkan dalam sebuah cerita rakyat iaitu dengan ekor seekor anjing. Pada suatu ketika dahulu, seorang lelaki Sikh telah mengikat seruling di ekor anjing, dengan mengharap ekornya akan menjadi lurus. Dibiarkan seruling itu diikat agak lama pada ekor anjing, namun lepas tempoh yang lama, ekor anjing itu tetap serong dan tidak lurus. Walaupun dicuba perkara yang sama berulang kali, ekornya tetap tidak

Jadual 2. Analisis peringkat resonans makna harfiah tentang seekor anjing

Kiasan Punjabi	*kuttey*	*dhi*	*pooch*	*kadhe*	*sidhi*	*nayi*	*hondhi*
Terjemahan langsung	anjing	punya	ekor	tidak	lurus	akan	pernah

Terjemahan gramatis : ekor **anjing** tidak pernah akan lurus

Makna : Seseorang yang jahat akan kekal jahat dan tidak akan insaf.

lurus , justeru masyarakat Sikh menganggap bahawa ekornya memang degil serta falsafah orang zaman dahulu yang unik iaitu dikaitkannya dengan sifat manusia yang negatif. Oleh itu, kiasan seperti *kuttey dhi pooch kadhe sidhi nayi hondhi* menyamai individu yang tidak mengubah sikapnya yang negatif.

Pada Jadual 3, makna skrip bagi kiasan *Gha da ghou cheriya chitte tere mu tey pyangey* ialah jika seseorang itu mengacau najis lembu, kita juga yang akan menjadi kotor. Ingin ditegaskan disini ialah, jika seseorang berbuat jahat kepada kita, jangan kita membalasnya dengan perbuatan yang jahat juga kerana diri kita sendiri akan menerima padah. Makna ini sangat jelas.

Jadual 3. Makna skrip bagi kiasan *Gha da ghou cheriya chitte tere mu tey pyangey*

Kiasan Punjabi	*Gha*	*da*	*ghou*	*cheriya*	*chitte*	*tere*	*mu*	*tey*	*pyengey*
Terjemahan langsung	lembu	punya	najis	kacau	tempias	kamu	muka	pada	kena

Terjemahan gramatis : mengacau najis **lembu** akan terpericik ke muka sendiri

Makna : Kalau seseorang membalas balik kejahatan pada orang yang memang sudah bermasalah, kita juga yang akan menimpa padah

Namun, jika difikirkan secara kognitifnya, padah yang diterima dapat dikaitkan dengan kiasan tersebut ialah najis lembu kerana najis itu sendiri merupakan sesuatu yang kotor dan busuk serta kiasan ini dikaitkan dengan insan yang buat perkara jahat. Apabila seseorang terkena tempias najis itu, individu tersebut akan diselubungi kekotoran. Jadi, pemikiran masyarakat Sikh yang ingin disampaikan dalam kiasan ini ialah najis lembu itu umpama manusia yang bertindak jahat, namun jangan kita menyentuh najis tersebut iaitu membalas dengan perbuatan yang sama,

kerana kita juga yang akan mendapat tempiasnya. Kiasan ini menjadi semakin menarik apabila falsafah dan akal budi masyarakat Sikh dikaitkan dengan penciptaannya. Peringkat ini menerbitkan persoalan seperti mengapa najis lembu yang digunakan oleh masyarakat Punjabi? Kenapa tidak najis ayam atau najis kambing?

Hal ini demikian kerana masyarakat Punjabi di India, banyak membela lembu bagi sumber pendapatan mereka. Lembu digunakan untuk aktiviti pertanian dan juga susu lembu amat penting dalam kehidupan masyarakat Sikh (Sarjit Singh, 1999). Hampir setiap upacara keagamaan yang dibuat menggunakan susu lembu iaitu pemberian *Karha Prasaad* (manisan yang dibuat daripada susu lembu). Menurut informan (Satwan Kaur, komunikasi lisan, November 3, 2017), masyarakat Punjabi dahulu menggunakan najis lembu (*thappi*) sebagai bahan api kerana tiada arang digunakan. Proses *thappi* itu bermula dengan mengumpul najis lembu itu secara bulat seperti batu, kemudian dikeringkan bawah matahari terik agar menjadi keras. Pengumpulan najis itu dibuat dengan tangan iaitu mengambil najis itu dan membuatnya dalam bentuk bulat yang besar. Semasa membuat itu, najis boleh terpercik di muka atau badan jika tidak dilakukan dengan berhati-hati. Begitu juga dengan kiasan itu, iaitu jika kita membalas perbuatan yang jahat terhadap orang yang sudah bermasalah, kita sendiri akan ditimpa padah. Oleh itu, masyarakat Punjabi menggunakan kiasan *gha dha ghou cheriya chitte tere mu tey pyangey* kerana penggunaan najis lembu memberi cahaya di rumah sebagai bahan api, tetapi jika cara penggunaan najis itu tidak betul dan menyebabkan kekotoran, maka tiada cahaya yang dapat dihasilkan. Menjurus kepada sikap manusia, jika dibalas perbuatan jahat kepada insan yang sudah bermasalah, kita juga yang akan ditimpa malang.

Avdha ghora na pajayi ja membawa makna skrip nya sebagai seseorang yang menuturkan sesuatu tanpa fakta mahupun hanya menipu dan mereka cerita. Istilah kuda (*ghora)* dan laju (*pajayi*) seperti pada Jadual 4 digunakan kerana seekor kuda berlari dengan laju dan begitu juga, apabila seseorang mengungkapkan sesuatu pertuturan ia diungkapkan dengan begitu pantas tetapi tidak menepati perkara yang sebenar.

Jadual 4. Makna skrip bagi kiasan *Avdha ghora na pajayi ja*

Kiasan Punjabi	*Avdha*	*ghora*	*na*	*pajayi*	*ja*
Terjemahan langsung	kamu	kuda	jangan	laju	terus
Terjemahan gramatis	: Jangan menunggang **kuda** kamu dengan laju				
Makna	: Seseorang yang bercakap tanpa fakta yang sahih (melibatkan unsur dongeng)				

Tidak dapat disangkal secara fizikalnya, seekor kuda ialah binatang yang kuat dan pantas. Pada zaman dahulu, tenaga kuda sangat diperlukan oleh perajurit sewaktu berperang kerana zaman dahulu kuda merupakan satu-satunya pengangkutan yang laju dan boleh sampai ke lokasi berperang dengan pantas. Ketiadaan tulang selangka yang menyebabkan kuda berlari dengan pantas dan lebih lebar (Bowling & Ruvinsky, 2000). Kuda sehingga sekarang digunakan dalam perlumbaan, iaitu kuda berlari tanpa henti dan tanpa halangan. Kelajuan kuda terserlah di litar balapan tersebut. Begitu juga jika dikaitkan dengan lidah manusia yang mudah mengeluarkan kata-kata tanpa berfikir. Apa sahaja yang diungkapkan tidak boleh ditelan semula kerana percakapan manusia laju seperti larian seekor kuda. Hal ini dapat diselongkar dengan analisis peringkat resonans yang mengaitkan kognitif di sebalik ciptaan kiasan ini.

Falsafah serta akal budi masyarakat Punjabi ditelusuri seterusnya untuk mengesan makna sebenar di sebalik ciptaan kiasan ini yang memaparkan penggunaan unsur kuda ini. Menurut (Amarjit Kaur, komunikasi lisan, Oktober 16, 2017), masyarakat Punjabi mempunyai hubungan yang rapat dengan kuda. Hubungan ini terserlah dalam peperangan semasa pada zaman Guru Gobind Singh. Pakatan Mughal menentang beliau dan ingin menguasai tanah yang dimiliki oleh Guru Gobind Singh. Dalam penghijrahan penduduk kampung serta dalam peperangan hanya kuda yang digunakan sebagai pengangkutan. Kuda hanya mengikut rentak individu yang menanganinya. Dapat dilihat bahawa kuda hanya mengikut rentak yang dibawa oleh manusia tanpa mengetahui jalan yang dilalui itu membahayakan atau tidak, dan penyataan ini menjurus kepada ungkapan fakta yang tidak kukuh apabila seseorang mengungkapkan sesuatu yang tidak sahih. Guru Gobind Singh juga merupakan satu-satunya guru yang mempunyai kuda baka 'Blue Roan'. Pada zaman dahulu, kuda Guru Gobind Singh digelar sebagai '*Neela Ghora*' kuda biru atau '*Neelay ghoray they swaar*' yang bermaksud penunggang si kuda biru. Guru Gobind Singh telah belajar seni tunggangan kuda dan dengan segala ilmu yang dipelajari beliau mengarah warga Sikh untuk menyediakan senjata dan kuda demi masa hadapan sebagai langkah keselamatan. Ungkapan langkah keselamatan itu membuktikan bahawa seekor kuda boleh digunakan pada saat-saat genting kerana kuda merupakan salah satu binatang yang boleh berlari laju. Jadi, akal budi masyarakat Sikh tentang kiasan *avdha ghora na pajayi ja* dapat dilihat sejak zaman Guru Gobind Singh lagi, kerana ungkapan manusia serta kelajuan seekor kuda tidak dapat dipisahkan.

Desi kutta kureshani boli sperti pada Jadual 5 membawa maksud seseorang yang berlagak pandai, tetapi sebenarnya kurang pengetahuan tentang sesuatu perkara tersebut. *Desi kutta* iaitu anjing kampung digunakan dalam kiasan ini yang merujuk kepada anjing jalanan. *Desi* sendiri merujuk kepada orang Punjabi di kawasan kampung.

Mengapa anjing jalanan yang diperlihatkan sebagai seorang yang berlagak pandai? Hal ini demikian kerana seekor anjing mempunyai ciri yang sangat agresif dan berani berhadapan dengan apa-apa sahaja situasi. Walaupun anjing itu tidak mempunyai idea tentang apa yang sedang berlaku di sekelilingnya, ia tetap akan berada di situasi tersebut dan seolah-olah ia faham apa yang sedang berlaku (Horowitz, 2009).

Jadual 5. Makna skrip bagi kiasan *Desi kutta kureshani boli*

Kiasan punjabi	*desi*	*kutta*	*qureshy*	*boli*
Terjemahan langsung	kampung	anjing	Quresh	percakapan
Terjemahan gramatis	: **anjing** kampung yang mempunyai loghat bahasa asing.			
Makna	: seseorang yang berlagak pandai.			

Dalam memperlihatkan akal budi orang Punjabi, menurut informan (Amarjit Kaur, komunikasi lisan, Oktober 16, 2017), kiasan ini sangat berkait rapat dengan sejarah *The history of Bhagat Singh*. Sejarah ini mengisahkan tentang cara Bhagat Singh cuba mempertahankan hak di negara India daripada jajahan British. Pada masa dahulu, Pakistan dan India masih belum dipisahkan dan Bhagat Singh berasal daripada Lyallpur, Punjab India yang kini adalah di Pakistan selepas perpisahan sempadan. Namun, ada sesetengah rakyat di India bekerjasama dengan pihak British dan menimbulkan ketidakpuashatian sesetengah masyarakat, sehingga berlaku kejadian yang menjadi sejarah hitam masyarakat di India iaitu serangan di Jallianwala Bagh. General Dyer melancarkan serangan dengan menembak semua orang Sikh yang tidak bersalah dan isu tersebut menjadi panas sehingga Bhagat Singh mengambil keputusan untuk menghalau British. Golongan atasan yang bekerjasama dengan pihak British menganggap dirinya sama peringkat dengan British, sedangkan mereka tidak tahu apa yang sedang dimanipulasikan oleh pihak British. Golongan atasan iaitu penduduk masyarakat India, bersubahat dengan British demi kepentingan sendiri dianggap sebagai *desi kutta* dan *qureshy boli* dikaitkan dengan ungkapan kerjasama mereka dengan pakatan British, sedangkan orang desi (Punjabi) harus menuturkan bahasa Punjabi (Punjabi boli). Masyarakat India harus berkerjasama menghalau pihak British, namun demi kepentingan sendiri, mereka bersubahat dengan pihak British. Oleh itu, muncul kiasan seperti *desi kutta kureshani boli* bagi individu yang hanya berlagak pandai, sebaliknya kurang pengetahuan tentang kebenaran perkara.

KESIMPULAN

Kajian ini yang menggunakan pendekatan semantik inkuisitif melalui tahap semantik skrip, semantik resonans dan semantik inkuisitif dapat memperlihatkan falsafah dan akal budi masyarakat Punjabi. Hasil dapatan juga menunjukkan bahawa penggunaan unsur haiwan yang digunakan dalam kiasan menjurus kepada sifat negatif seseorang. Tuntasnya, kajian kiasan Punjabi yang mempunyai unsur haiwan menjadi satu sumber bukti berkaitan dengan pemikiran dan akal budi masyarakat Punjabi yang beranggapan haiwan dapat menyamai sifat manusia secara negatif. Melalui kiasan ini menunjukkan bahawa masyarakat Punjabi mempunyai pemikirannya yang tersendiri berkaitan dengan setiap jenis haiwan. Setiap haiwan menggambarkan makna implisit di sebalik setiap kiasan tersebut. Pengkaji mengaplikasikan teori semantik inkuisitif yang dapat memperlihatkan falsafah masyarakat Punjabi. Kajian ini bukan sahaja menyerlahkan segala kepercayaan, sejarah di sebalik adat atau budaya Punjabi, malah memperlihatkan cara hidup masyarakat Punjabi pada zaman dahulu melalui analisis kiasan tersebut. Kajian ini juga bukan sekadar menunjukkan akal budi masyarakat Punjabi, malah memberi ilham agar mengamalkan budaya yang diwarisi sejak dahulu supaya tidak hilang ditelan zaman. Kajian ini diharapkan memberi satu sumbangan terhadap bahasa kiasan Punjabi untuk didokumentasikan agar diketahui oleh masyarakat lain, di samping mengenali akal budi serta falsafah masyarakat Punjabi di sebalik kiasan berunsur haiwan yang bersifat ironi.

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