CHAPTER 5

CONCLUSION

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Six Malaysian plants have been fully studied for their alkaloidal content. Three plants are from the genus of *Phoebe* and three from the genus of *Dehaasia* as shown in Table 5.1.

Two plant samples of *Phoebe grandis*, which were collected from two different localities *i.e* Pahang (KL4994) and Kelantan (KL4224), (see Chapter 6) produced two aporphines, five proaporphine-tryptamines, seven proaporphines, and one indoloquinolizidine. Phoebegrandine A **28** and phoebegrandine B **29** were present in the leaves of all plant samples. *Phoebe grandis* collected from Pahang (KL 4994) and Kelantan (KL4224) bark samples produced proaporphines, whereas the aporphines only appeared in sample collected from Kelantan. Interestingly, the latter (KL4224) also produced three novel proaporphine-tryptamines ; phoebescortechiniine A **175**, phoebegrandine C **173** and phoebegrandine D **174** besides a novel indole alkaloid, phoebegrandine E **176**. This is the first report of an indole alkaloid existence in the *Phoebe* species.

We observed that *P. scortechinii* also produced alkaloid closely related to *P. grandis*. Both produced proaporphines, aporphines and proaporphine-tryptamines. Meanwhile, *P. lanceolata* produced only aporphine alkaloids.

A total of nine morphinandienones were isolated from two *Dehaasia* species *i.e. D. longipedicellata* and *D. undolleana*. The occurrence of morphinoid alkaloids

from *Dehaasia* species had never been reported before. However, this type of alkaloid was absent in *D. incrassata*. This species produced another type of alkaloids *i.e.* bisbenzylisoquinoline.

The findings showed that different samples collected from different localities might produce different alkaloids although their structures are similar and related to one another. These results also showed the chemical relationship between both samples and the slight difference in the alkaloid content may be due to various reasons such as climate, soil type, age of plant and many others[139,140].

Table 5.1: The types of alkaloid isolated from the genus *Phoebe* and *Dehaasia*

Species	Plant Part	Remarks	Type of skeleton
Phoebe grandis KL 4224	Leaves	Phoebegrandine E **176**	Indoloquinolizidine
		Tetrahydroglaziovine **178**	Proaporphine
		Phoebegrandine C **173**	Proaporphine-tryptamine
		Phoebegrandine A **28**	Proaporphine-tryptamine
		Phoebegrandine B **29**	Proaporphine-tryptamine
		Phoebegrandine D **174**	Proaporphine-tryptamine
	Bark	Boldine **97**	Aporphine
		Grandine A **179**	Proaporphine
		Grandine B **180**	Proaporphine
		Norboldine **98**	Aporphine
		Lauformine **160**	Proaporphine
Phoebe grandis KL 4994	Leavs	Tetrahydropronuciferine **177**	Proaporphine
		Tetrahydroglaziovine **178**	Proaporphine

Table 5.1 [Continued]

Species	Plant Part	Remarks	Type of skeleton
		Phoebescortechiniine A **175**	Proaporphine-tryptamine
		Phoebegrandine A **28**	Proaporphine-tryptamine
	Bark	Grandine C **183**	Proaporphine
		Grandine D **184**	Proaporphine
		Norhexahydromecambrine A **187**	Proaporphine
Phoebe scortechinii KL 4886	Leaves	Tetrahydropronuciferine **177**	Proaporphine
		Phoebescortechiniine A **175**	Proaporphine-tryptamine
		Phoebegrandine A **28**	Proaporphine-tryptamine
		Phoebegrandine B **29**	Proaporphine-tryptamine
	Bark	Hexahydromecambrine A **186**	Proaporphine
		Grandine B **180**	Proaporphine
		Grandine C **183**	Proaporphine
		Norboldine **98**	Aporphine
		Norhexahydromecambrine A **187**	Proaporphine
Phoebe lanceolata KL 4763	Leaves	Liriodenine **135**	Oxoaporphine
		Roemerine **47**	Aporphine
		Norboldine **98**	Aporphine
		Laurotetanine **99**	Aporphine
	Bark	Liriodenine **135**	Oxoaporphine
		Roemerine **47**	Aporphine
		Sebiferine **71**	Morphinandienone
		Norboldine **98**	Aporphine
		Asimilobine **57**	Aporphine
		Boldine **97**	Aporphine
Dehaasia longipedicellata KL 4719	Leaves	(+)-Milonine **190**	Morphinandienone
		(+)-Pallidinine **188**	Morphinandienone

Table 5.1 [Continued]

Species	Plant Part	Remarks	Type of skeleton
		(-)-Pallidine **189**	Morphinandienone
		(-)-Sinoacutine **81**	Morphinandienone
		(-)-8,14-Dihydrosalutaridine **191**	Morphinandienone
Dehaasia	Leaves	Perakensol **193**	Phenantrene
candolleana		(-)-Sebiferine **71**	Morphinandienone
KL 4683		(+)-Sebiferine **192**	Morphinandienone
		Pallidine **189**	Morphinandienone
Dehaasia	bark	(-)-3', 4'-Dihydrostephasubine **198**	Bisbenzylisoquinoline
incrassata		(-)-Norstephasubine **201**	Bisbenzylisoquinoline
KL 4640		(-)-Gyrolidine**194**	Bisbenzylisoquinoline
		Stephasubine **202**	Bisbenzylisoquinoline

From the studies of the *Dehaasia* and *Phoebe* species of the Lauraceae family we observe: All alkaloids successfully elucidated belong to the isoquinoline type except for one indoloquinolizidine; phoebegrandine E of which sixteen were novel. Three species showed positive response to anti plasmodial activities *i.e. P. grandis, P. scortechinii* and *D. longipedicellata*. In addition, eleven selected alkaloids isolated from the genus of *Phoebe* and *Dehaasia* have been tested for CNS activity using radioligand receptor binding assays. Norhexahydromecambrine A **187** showed significant activity (64 % inhibition) to inhibit binding upon ^{3}H-scopolamine, which labels muscarinic receptor. This shows that the Lauraceae family is a good source to find new, interesting and bioactive compounds, which can help develop new drugs and develop our own pharmaceutical industry.