

BRAIN PROTECTING EFFECT OF PHILIPPINE STINGLESS BEE PROPOLIS: POTENTIAL FOR THE MANAGEMENT OF ISCHEMIC STROKE

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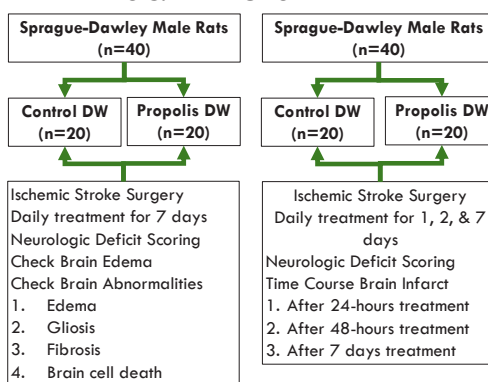
ABSTRACT

Stroke is the number two cause of mortality in humans globally. The neuroprotective activity of the Philippine stingless bee (PSB) propolis against the most common type of stroke, ischemic stroke was investigated using Sprague-Dawley (SD) rats. Rats were divided into two treatment groups (n=20/grp): Control group, treated with distilled water (DW) & PSB propolis group. Ischemic stroke was surgically induced in 8-week old SD male rats by occluding the blood vessel supplying the brain. Neurologic deficit scoring (NDS) was done daily during the 7-day treatment period. The PSB propolis & vehicle distilled water were given via gavage daily after performing NDS for the entire 7-day treatment period. PSB propolis treatment significantly improved the ischemic stroke-induced motor deficits like limb & tail paralysis, & immobility compared with the control DW treated rats. Moreover, PSB propolis treatment remarkably reduced the brain swelling, & attenuated brain microscopic abnormalities like hippocampal asymmetry, hippocampal fibrosis & gliosis, cerebro-cortical edema, fibrosis, neuronal degeneration due to ischemic stroke insult. Additionally, time course study using another set of ischemic stroke SD rats showed that PSB propolis treatment significantly minimized ischemic stroke-induced brain infarction compared with the control DW treated rats. These findings reveal the brain protecting effect of the PSB propolis against ischemic stroke.

INTRODUCTION

Stroke is an episodic impairment of sufficient cerebral vascular perfusion due to ischemia or hemorrhage that causes irreversible brain tissue damage manifested by neurologic deficits especially motor impairments & paralysis. Ischemia-induced stroke is primarily caused by lack of sufficient blood supply to the brain. This leads to a cascade of electrolyte imbalance, excessive free radical release, brain tissue injury, edema & brain cell death. Current management of ischemic stroke mainly involves surgery i.e. craniotomy, hemicraniectomy to reduce brain edema & thrombectomy remove blood clots. Thrombolytics & anticoagulants are used for lysis of clots & preventing further blood clot formation, respectively. Neuroprotectants are also given to prevent free radical formation, & inhibit inflammatory cells recruitment & brain cell death. Exploring the brain protecting activity of PSB propolis was investigated in ischemic stroke since it possesses potent anti-inflammatory & anti-oxidant activities which contributes to the causation of stroke.

MATERIALS & METHODS



RESULTS

Fig. 1 Mean Neurologic Deficit Scores Treated Ischemic Stroke Rats

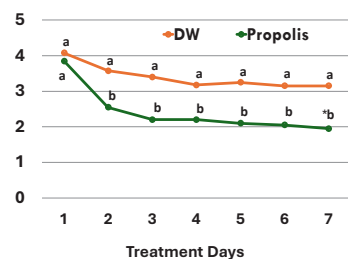


Fig. 3. Neuroprotection of PSB Propolis: Hippocampal Asymmetry and Lesions

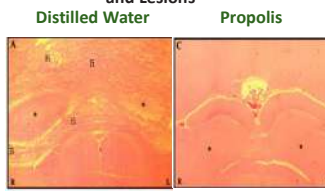


Table 1. Mean Infarct Size in Hippocampus of Treated Ischemic stroke Rats

Treatment groups	Hippocampal Infarct (%)		
	Day 1	Day 2	Day 7
Distilled water	31.34%	29.02%	45.27%
PSB Propolis	3.21%	4.20%	4.01%

Fig. 2. Brain of Treated Ischemic Stroke Rats

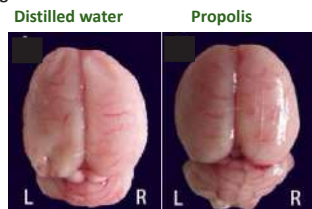
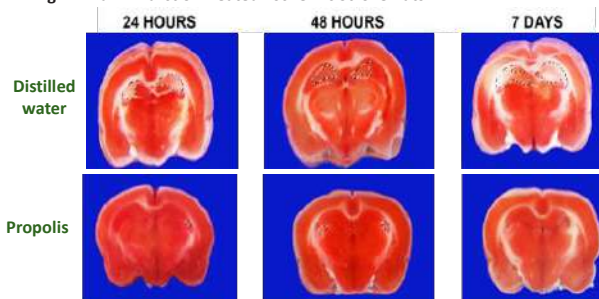


Fig. 4. Brain Infarct of Treated Ischemic Stroke Rats



CONCLUSION

The Philippine stingless bee propolis contains bioactive compounds with potent neuroprotective activities which abrogated the neurologic motor deficits, brain edema, infarction, and pathologic lesions induced by ischemic stroke which shows its high potential as an alternative substance for the management of ischemic stroke.

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