Abstract

The research and development of highland herbal plant for developing commercial products has two herbal target groups: tonic and antidote groups

The herbal and traditional medicine of tonic group was continuously studied for sexual competency activity and effects on cardiovascular on *Limacia triandra* Miers and *Mucuna macrocarpa* Wall. which are still left in progress from year 2016. Then, all results of the studies of four herbs (*Aspidistra elatior* Blume., *Elephantopus scaber* L., *Limacia triandra* Miers and *Mucuna macrocarpa* Wall.) are evaluated and two of them are chosen for studying acute and chronic toxicities in order to be information for considering the development of commercial product later. The results of the study are as follows.

The study of of *Limacia triandra* Miers and *Mucuna macrocarpa* Wall on sexual competency and the activity showed that these extracts at equivalent dosage to human (1,800 mg/kg and 400 mg/kg) were likely to increase behavior of straddle on female and decrease duration of mounting the female rat. However, these extracts had no effect on testosterone levels in the animal blood.

The study of of *Limacia triandra* Miers and *Mucuna macrocarpa* Wall on cardiovascular system showed that the intravenous administration of both extracts decreased blood pressure and heart rate as a dose dependent manner, but this effect had short duration of action.

From the evaluation of all studies, *Aspidistra elatior* Blume and *Elephantopus scaber* L. can increase sexual competency with no effect on hormone change in testosterone. In addition, they have short harvest age and easily propagate. Thus, these two herbs were selected for the next study on the toxicity.

The study of acute toxicity revealed that the single oral administration of 5,000 mg/kg of *Aspidistra elatior* Blume and *Elephantopus scaber* L. caused no acute toxicity. In addition, the study of chronic toxicity showed that the administration of 100, 500, and 2,500 mg/kg of *Elephantopus scaber* L. for 180 days increased or decreased clinical chemistry of blood within the normal range. However, the chronic toxicity study of *Aspidistra elatior* Blume is in progress.

The study of acute toxicity revealed that the single oral administration of 5,000 mg/kg of *Aspidistra elatior* Blume and *Elephantopus scaber* L. caused no acute toxicity. In addition, the study of chronic toxicity showed that the administration of 100, 500, and 2,500 mg/kg of *Elephantopus scaber* L. for 180 days and 30, 150 และ 750 mg/kg of *Aspidistra elatior* Blume increased or decreased clinical chemistry of

blood within the normal range. The histopathology examination of the internal organs or tissue including brain, lungs, heart, liver, kidneys, spleen, stomach, duodenum, small intestine, and sex organs showed no significant histopathological change in these internal organs or tissues especially liver and kidney.

The herbal and traditional medicine of antidote group was under research and development of product in lab-scale for testing in the clinical phase. Furthermore, the researcher has suggested an approach for developing herbal product/ traditional medicine in community. The preliminary results are as follows.

Four herbal medicines in the detoxifying formulation; *Thunbergia laurifolia* Lindl., *T. coccinea* Wall. ex D.Don, *Morinda angustifolia* Roxb. var. *angustifolia* and *Embelia ribes* Burm.f., were evaluated for their quality of raw material followed the methods in the Thai Herbal Pharmacopoeia. According to the previous specification data in 2016, the results of this year are consistent to the described criteria. Four kinds of the herbal medicines were mixed and then extracted by decoction. The water extract was concentrated and dried by a spray dryer to obtained yellowish-brown powder (832.88 G, 7.71 % w/w). The extract was evaluated its physical and chemical properties.

The extract was developed as a capsule formulation with 125 mg of extract/capsule. The advantage of this dosage form is no dramatic change of the extract similar to the condition of the previous studies on pharmacological activity and toxicology. The clinical study should use the pharmaceutical product which is representative to the *in vivo*-study for an accuracy of the results.