

Short note :

**POLLINATION IN FLOWERS OF *CROTALLARIA URASAMOENSIS*
BAKER (PAPILIONACEAE), BY BEE POLINATORS**

by

MOHAMMAD AMIR AND SIH KAHONO

Museum Zoologicum Bogoriense, Puslitbang Biologi
Research and Development Centre for Biology,
The Indonesian Institute of Sciences (LIPI)

The flowers of *Crotalaria urasamoensis* has the characteristics in having the flowers mostly conspicuously papilionaceous in terminal or axillary, with many flowered inflorescence; the flower being yellow streakly at first which later turn orange or orange brown afterwards (Backer and van den Brink Jr. in *Flora of Java*, vol. 1 : 583-585, 1963). Observations were made on insect visitors frequenting flowers of *C. urasamoensis* which grew wild at Baranangsiang and Sindangbarang area in the district of Bogor. As many as 15 species of insect visitors were found frequented the flowers. They consisted of Diptera: Drosophyllidae (2 species), Syrphidae (1 species), Muscidae (1 species); Lepidoptera : *Jamides* sp. (1 species). *Jamides parasaturatus*, *Halpe* sp. (1 species), Hesperidae (1 species), Hymneoptera : *Xylocopa latipes*, *X. confusa*, *Camponotus irritans* and *Camponotus* sp., *Anoplolepis longipes*, *Megachile opposita* and Formicidae (1 species).

Pollination of flowers in *C. urasamoensis* can occur when the flowers are visited by appropriate insect visitors, as its anthers and pistils are located hidden in the flowers parts which is called carina (Fig. 1) and is very hard for most insect visitors to break through. Among all insect flower visitors, only those having large body and strong mouth parts, *X. latipes*, *X. confusa* and *M. opposita* (Fig. 2) are able to overcome the problem, enabling the pollination process to take place.

The presence of rough and long hair over the body and legs of the three species of bees play important role in carrying pollen grain from flowers they visited. Hairs on the ventral abdomen of *M. composita* are evenly woven to form a pollen basket. Pollen grains from one flower adhering to the bee hairs are transported to other flowers

during bee visit, facilitating cross pollination to take place among flowers of the same species.

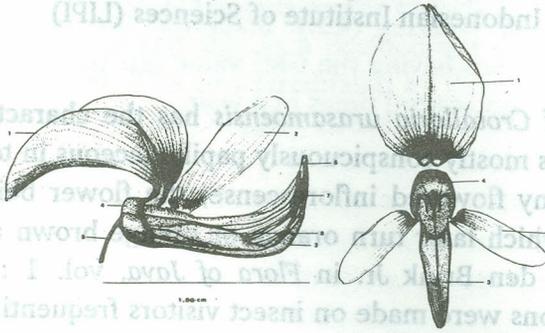


Figure 1. The flower of *Crotalaria urasamoensis*

- A. Lateral view : The pistil and anther are liberated from carina
- B. Upper view : The pistil and anther are enclosed by carina
- 1. vellum 3. calyx 5. stem 7. anther
- 2. wing 4. carina 6. pistil 8. young pod

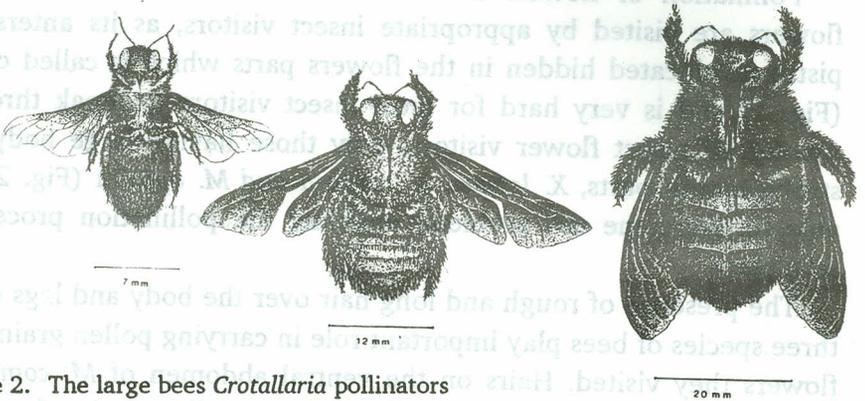


Figure 2. The large bees *Crotalaria* pollinators

- 1. *Megachile opposita*, ventral view
- 2. *Xylocopa confusa*, ventral view
- 3. *X. latipes*, ventral view

In addition, when the bees land and sit on the flower, the bees grasp the corolla and the carinal with their legs. Using their stout

mouth part, the bees suck the nectar up from the scape of the corollal velum and keep staying or hanging over the flower. In this position, the bees body weight exerts such a pressure on the carinal, making the stamens and pistil of the flower protrude through a small hole at the tip of carinal. Upon observation it was found that the body weight of *X. latipes*, *X. confusa* and *M. opposita* was 1.05, 0,36 and 0,17 gr respectively. Such weight is sufficient to modify the position of the corollal part of the flower. In this way the stamens and pistil meet together, and at the same time they are touched by the hairs which cover the ventral part of the bees body.

The inflorescence visit done by *X. confusa* and *X. latipes* to *C. urasamoensis* are mainly for sucking nectar, but at the same time the bees may act as agents for carrying pollen grains. Upon observation it was found that the bees brush the pollen grain using their mesothoracic legs and keep the pollen grain on hairs of ventral adomen. In this way, the bees facilitate the occurrence of cross pollination on other flowers during successive visits.

An experiment to isolate the flowers of *C. urasamoensis* by means of exclusion of the flowers from the visit of *X. latipes* and *X. confusa* showed that the flower fails to produce seeds in pods.

Representatives are very rare in tropical regions. The most recent record in the Western Hemisphere is by Hovgig (Guerin) from the State of Chiapas, Mexico (ca. 17 N) (Sly, 1988). One genus, *Acheilophas* Benson, with two species, is known from Madagascar (ca. 20 S) (Benson, 1946). In Asia, a species of *Janus* Stephens and one of *Urosyris* Muls have been recorded from as far south as Burma (ca. 22 N) (Benson, 1946).

The species described below as *Janus eparinatus* from western Kalimantan, Indonesia, now represent the most southern record of Cribidae in Asia, the second genus and third species from the Southern Hemisphere, and the first record of the family from Indonesia.

About ten species of *Janus* are known from Eurasia and North America. Larvae are twig borers, and recorded hosts are species of *Milva*, *Populus*, *Pyrus*, *Ribes*, *Quercus*, *Salix*, and *Viburnum*. Adults are