

SECTION 9: LAND SNAILS

SNAIL FAUNA UNDER VARYING LAND USE TYPES

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As part of a program on lowland forests of the Center for International Forestry Research (CIFOR, Bogor), a number of plots in various land use types in the Jambi lowland region in Central Sumatra were studied. The plots are situated in the Pasir Mayang - Muarabungo area, on low-nutrient ultisoils, at an altitude of 3-80 m asl.

In order to obtain some idea of the snail fauna present, soil samples were collected on 28/29 November 1997 by A. Gillison and E. Pumono (BIOTROP). In each 40x5 m transect, 3 x 1m² quadrats were sampled (one each at 0, 20 and 40 m points along the transect) and bulked. Loose leaf litter was removed by hand and the soil-litter interface was scraped by hand to a depth of about 3 cm. The samples were stored in plastic bags with holes punched in for aeration. All samples were collected during the start of the wet season, and were moist at the time of collection.

Upon arrival at the laboratory of the author, the samples were first generally assessed. Because all of them appeared either void or extremely poor in snails, it was decided to scan only a standardized portion of each sample (rather than the entire sample) in order to save time. The samples were then sieved to remove the fraction larger than 5 mm. Two samples were floated in water, a technique applied to remove rock pebbles and inorganic silt. Because this hardly reduced the size of the samples, this method was abandoned, and all samples were spread out to dry. After this, the samples were sieved through a 3 mm mesh sieve. The fraction of 3-5 mm was checked entirely for the presence of snails by systematically scanning small amounts spread thinly over a black surface. The fraction smaller than 3 mm was sieved again to remove all dust smaller than 0.8 mm. Then 0.3 liter of this fraction was selected by the method of piling-and-quartering. This 0.3 l sample was checked for snails as described above. A small portion of the fraction smaller than 0.8 mm was also checked.

The results are listed in Table 9.1, below.

Most samples proved indeed void of snails, and even the few containing some shells can be considered extremely poor. Usually, the absence of snails is related to a low pH of the soil, which makes the environment extremely unsuitable for shell-bearing, soil-dwelling snails. The shell of any arboreal snail dying and falling to the forest floor also dissolves rapidly. As a consequence, soil samples without shells do not necessarily indicate the absence of a snail fauna.

However, at least some of the studied soil samples contained one or a few fresh-looking shells of soil-dwelling species (one with the dried animal still inside). This indicates that at least these samples formed a suitable habitat for snails, or can preserve for some period of time the shells of any arboreal species fallen to the forest floor. I, therefore, assume that the samples have been

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collected on localities that harbor at most an extremely poor snail fauna, both in species as well as in individuals.

In spite of this, the snail fauna collected are not without significance. The genus *Eremopeas*, known from northern and central Australia, is well characterized by the sculpture of the top of the shell. It is highly surprising to find a species apparently belonging to this genus on Sumatra. A first assumption would be its unintentional introduction by mankind. However, the Sumatran shells appear different from the two known Australian species. Therefore, the occurrence of a native, yet undescribed species of this genus in Sumatra seems more likely. The material now available (2 juvenile shells) is insufficient for a scientific description of the species. I therefore advise to search plot BS06 for more material; adults are probably slender shells of 5-15 mm high, of whitish or greenish colour. Both empty shells as well as living material preserved in alcohol of this remarkable species are very welcome.

Paropeas achatinaceum is probably native to Sumatra, but occurs widespread throughout SE Asia. *Lamellaxis clavulinus* are introduced species, originating from Africa. Both species add nothing to the biodiversity value of the plots.

Slugs (snails without a shell) may have been present on the plots. Mainly living on vegetation, they do not leave any trace when dying, and their presence cannot be ascertained by soil samples. Primary forests otherwise void of any snail species are known to harbor species of slugs on Borneo.

The samples consisted mainly of little decayed leaf litter, twigs, fruits, seeds and other organic matter. Rather remarkable was the abundant presence in most samples of small grains of perfectly transparent quartz, often attached to organic matter; some with a rounded but smooth surface, others displaying the typical trigonal crystal faces of this mineral. It is suggested that these quartz grains are possibly autigenous, that they are precipitated in situ in water saturated with SiO₂ after percolating through sandy soil.

Table 9.1
List of samples and the snail species found per sample.

| Code | Environment | Date of collecting | Vol. in litres* | Snail species found, and number of specimens |
|-------------|----------------------------------|---------------------------|------------------------|---|
| BS10 | Jungle Rubber | 27/11/97 | 1.7 | void |
| BS11 | Jungle Rubber | 27/11/97 | 1.0 | void |
| BS 01 | Primary forest | 29/11/97 | 2.4 | void |
| BS 02 | Primary forest | 29/11/97 | 2.4 | void |
| BS 03 | Heavily logged rain forest | 29/11/97 | 3.4 | void |
| BS 04 | Logged over in 1983 | 28/11/97 | 1.3 | void |
| BS 05 | Logged over in 1983 | 28/11/97 | 1.4 | void |
| BS 06 | <i>Paraserianthes</i> plantation | 29/11/97 | 4.4 | <i>Eremopeas</i> sp. (2, juv.) |
| BS 07 | <i>Paraserianthes</i> plantation | 28/11/97 | 5.6 | <i>Paropeas achatinaceum</i> (1, juv.) |
| BS 08 | Rubber plantation | 28/11/97 | 1.2 | <i>Lamellaxis gracilis</i> (1, fragm.) |
| BS 09 | Rubber plantation | 28/11/97 | 1.7 | void |
| BS 16 | <i>Chromolaena</i> fallow | 27/11/97 | 1.5 | <i>Lamellaxis gracilis</i> (1, adult) <i>Paropeas achatinaceum</i> (1, juv.) |

* Volume in litres, after removing the fraction >5 mm.