

**KALIGONO VILLAGE, A HOME FOR TREE SNAIL *AMPHIDROMUS*
(GASTROPODA : CAMAENIDAE)**

**DESA KALIGONO, RUMAH BAGI KEONG POHON *AMPHIDROMUS*
(GASTROPODA : CAMAENIDAE)**

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ABSTRACT

During recent flora fauna surveys on the karst ecosystem in Purworejo regency, Central Java, opportunities were taken to document tree snails species in Kaligono village of district Kaligesing. Visual observation method was applied. Three species were recorded, namely *Amphidromus furcillatus*, *Amphidromus heerianus*, and *Amphidromus perversus*. The behaviour of these tree snails was also discussed briefly.

ABSTRAK

Pada saat survei flora fauna ekosistem karst di Kabupaten Purworejo, Jawa Tengah, terdapat kesempatan untuk mendokumentasikan jenis keong pohon di desa Kaligono kecamatan Kaligesing. Metode yang digunakan adalah observasi secara visual. Tiga spesies telah dicatat, yaitu *Amphidromus furcillatus*, *Amphidromus heerianus* dan *Amphidromus perversus*. Perilaku siput pohon ini juga dibahas dengan ringkas.

INTRODUCTION

Land snails are capable of adapting their life to different types of habitat. Some species prefer to live in the forest, karst, or plantation near the village. Within the karst area, some species live in the floor or climb to the tree. Limestone rock (karsts) is one type of habitat which is rich in malacofauna composition (Clements *et al*, 2008). Karsts have important roles in the environment. The limestones are mainly exploited for cement and marble product. Karsts store water from the rain and keep maintaining the hydrological system and serve as sources of groundwater for consumption and irrigation (Clements *et al*, 2006). One of the karst system in Java is Menoreh formation which includes Kebumen and

Kaligesing (Rahmadi 2007). Despite the rich of malacofauna composition, only few studies have been carried out in Java (Marwoto & Isnainingsih, 2013; Irsyad *et al.*, 2015). Nurinsiyah (2015) reported two endemic species of tree snail from Sukolilo, *Amphidromus filozonatus* and *Amphidromus heerianus*. A field trip to monitor the diversity of malacofauna associated with karst system in Java has been conducted. One of the aims of this trip was to inventory the diversity of tree snail, mainly the genus *Amphidromus* in Kaligono.

METHODS

This field trip was carried out on April 19-20 2017 at Kaligono village between 158-

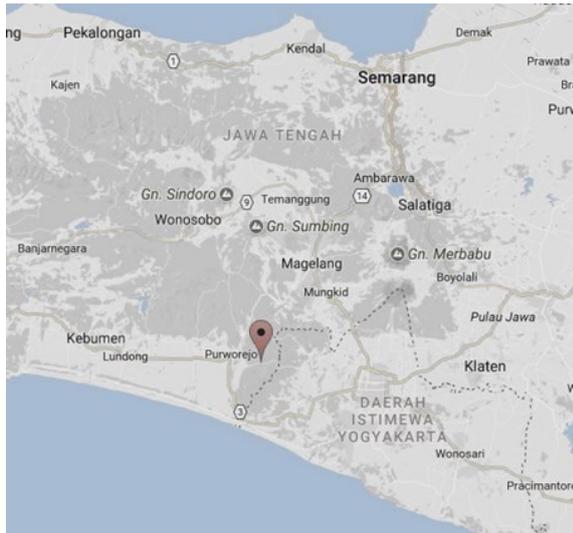


Figure 1. Map of the location of Kaligono village.

177 m a.s.l., S07°44'10.73"- S07°44'11.75" and E110°05'14.72"-E110°05'17.56". Kaligono is located in Kaligesing district, Purworejo regency, Central Java province. Purworejo is located on the west side of Yogyakarta. Normally, April is in the dry season. However, during this field trip the rain often falls late in the afternoon.

During two days, observation was made between 09.00 until 15.00 around the backyard near the houses and around the riverside with the total area not more than 1000 m² wide. Visual observations were made in the habitats normally preferred by *Amphidromus* snails such as tree trunks, shrubs or behind the leaves. When a snail was found, the species of the tree and where the position of the snail was noted. To estimate the distance between location where the snail found from the ground, I used my own height (165 cm) for comparison.

Snails were collected from trees with a height of less than 2 meter. They were photographed before captured by hand. Snails then drowned overnight in water to get the

relaxed position of the dead body. The specimen then preserved in 70% alcohol to be stored and identified in Museum Zoology Bogor. The specimen identified following van Benthem Jutting (1950).

RESULTS AND DISCUSSION

During this short time of observation, 15 samples of life and dead snail have been collected and identified into 3 species, namely *Amphidromus furcillatus*, *A. heerianus* and *A. perversus*(Figure2.). Total of individual observed were 43 snails. This number was much more numerous compare to the result of Irsyad *et al.* (2015). They only found 5 individual of *Amphidromus* snail from 2000 m² area in Pegunungan Sewu, Gunung Kidul. Even though the snails were found abundant in Kaligono, not all of them were collected due to conservation reason. Only snails that can be captured by hand were collected.

Among the three species of *Amphidromus* found here, *A. furcillatus* is the smallest (SL 25,34 mm, SW 12,80 mm). There was only one snail found attached on the upper surface of cassava leaf (*Manihot utilissima*), the high is about 150 cm from the ground (Figure 2. A). This cassava shrub is grown in the riverside of Kaligono river. The sinistral shell has five whorls, yellowish periostracum. Brown axial streaks are found in two forms, the thin ones are located on the upper half of the whorl, while the thick ones are located on the lower half of the whorl. A pair of yellow and brown spiral bands found circling along the last whorl. The animal is yellowish white, mostly in the gastric foot part. On the head part, the anterior tentacles and

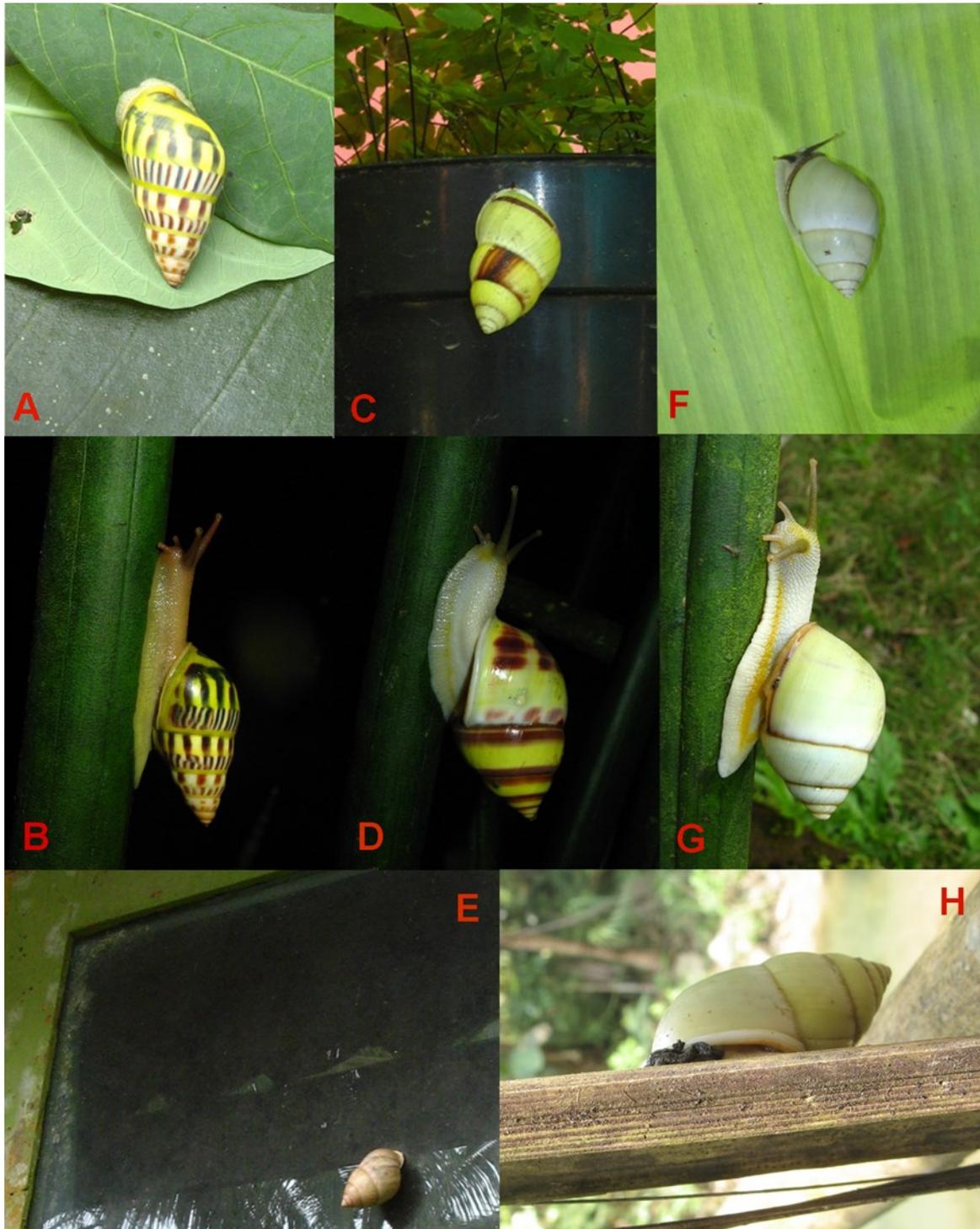


Figure 2. *Amphidromus furcillatus* (A, B), *A. heerianus* (C, D, E), *A.perversus* (F, G, H).

eye stalks are brown (Figure 2. B). This specimen is rather small compare with the van Benthem Jutting (1950) description (seven whorls, SL 31-36 mm, SW 16-20 mm). She explains that this species living in teak, coffee, rubber trees and various uncultivated trees.

However, this specimen was found living in cassava which is a cultivated shrub.

A. heerianus is in the medium size (SL 40,10-45,24 mm, SW 24,08-26,86 mm). Five specimens were collected, two dextral and three sinistral shells. Based on the observation, there

were more than 17 snails found in the location. These snails were found attached to flower pot (Figure 2. C) and on the cocoa (*Theobroma cacao*) leaf surface not more than 150 cm high from the land. The shell's periostracum is yellow or bright brown, six whorls, with two rows of thick brown spiral bands located just above and below the whorl lines. The animal is greyish white, with yellow spots along the upper part of the gastric foot that forming a yellow line along it. On the head part, the anterior tentacle and eye stalk are grey, yellow spots present just below and behind the eye stalk (Figure 2. D). This specimen is rather small compare with the van Benthem Jutting (1950) description (six-seven whorls, SL 52-55 mm, SW 30-32 mm).

A. perversus is the largest species (SL 31,22-51,14 mm, SW 20,64-26,42 mm). Nine specimens are collected, five dextral and four sinistral shells. Based on the observation, there were more than 25 snails found in the location attached to the leaf of banana (*Musa* sp.) (Figure 2. F), jackfruit (*Artocarpus* sp.), fig (*Ficus* sp.) coconut (*Cocos nucifera*), randu (*Ceiba petandra*) and rambutan (*Nephelium lappaceum*). The shell's periostracum is light yellow, six whorls, with one or two axial band on the whorl. The animal is greyish white, with yellow spots along the upper part of the gastric foot that forming a yellow line along it, thicker than in *A. heerianus*. On the head part, the anterior tentacle and eye stalk are grey, yellow spots present just below and behind the eye stalk (Figure 2. G).

Some snails were found attached on

houses. Local people (Slamet Mujiono) said that the children of the village often used the shell of *Amphidromus* for playing. Local people also utilize the meat of *Amphidromus* to feed the catfish that were reared in a pond near the house.

Based on the observation, *A. perversus* was easily seen on the branch or leaf on the higher trees compare to the two previous species. During the observation, I found two snails of *A. perversus* attached to the leaf of coconut tree grown near the bridge and road. Their position was very high compared to the other snails seen on the nearby tree. The coconut tree grew near the randu tree.

From the observation area, *A. perversus* can be found in trees with an estimated height of about 7,4 m. This is possibly the first record of the climbing behavior of the species reported from Menoreh karst area. Since some previous studies never mentioned this climbing behaviour (Marwoto & Isnaningsih, 2013; Irsyad *et al.*, 2015; Nurinsiyah (2015). *A. perversus* was found on higher trees compare to other non arboreal species with climbing behaviour such as *Achatina fulica* (up to 4 m high) and *Hemiplecta humpreysiana* (up to 3,5 m high) (Vinci *et al.* 1988; Kitt *et al.* 2014a). *Amphidromus inversus annamiticus* from Thailand was found attached on jackfruit tree with 5 m height, but the species was reported to live on trees with more than 10 m height (Sutcharit *et al.*, 2013).

The climbing behavior of tree snail could be due to several reasons. The snail is sensitive to heat, so they tend to seek



Figure 3. Estimation of the height of the snail *A. perversus* using observer's height as comparison. Inset: zoom of the snails. (Photographed by Dian A.N)

comfortable temperature and humidity just under the tree canopy (Moreno-Rueda *et al.* 2009). Like the other tree snail, *Amphidromus* is known to feed on microscopic flora such as fungal mats, lichens, or algal epiphytes which are grown on the tree trunks (Lok & Tan 2008). *Amphidromus* also known as a prey of rodents and bird (Kitt *et al.* 2014^b). They could escape from their predator by climbing and hide between the canopy. A few broken shell were found in the location, however, there was

no information from local people about what preys on them.

The occurrence of *Amphidromus* close to the houses in Kaligono was interesting. First, they were found abundant and live in such different species of tree. There were several tree that suitable as habitat for *Amphidromus*, such as rambutan and ficus (Sutcharit & Panha 2006), jackfruit (Sutcharit *et al.* 2013), banana, cocoa and acacia (Kitt & Kiat 2014). Their occurrence possibly depends

on the moisture and the availability of microflora as their food sources (Lok & Tan 2008; Sutcharit *et al.* 2013). Based on author experience from previous field trip in Java, *Amphidromus* was uneasy to found alive, even in the primary forest they could only be seen in small number. However, sometimes it was easy to find their dead shell on the ground. The relatively abundant of *Amphidromus* snail that can easily be seen on several tree species in Kaligono inspired the author to name Kaligono as the home for this tree snail.

CONCLUSIONS

There were three species of tree snail found in Kaligono village, namely *Amphidromus furcillatus*, *A. heerianus* and *A. perversus*. They were abundant since total individual observed were 53 snails from the total area not more than 1000 m² wide. *A. perversus* could climb up to about 7,4 m which is the highest record of the climbing behavior of tree snail reported from Indonesia.

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