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# New record of *Hermarchus leytensis* Zompro, with notes on its life history (Phasmatodea: Phasmatidae).

**Marco Gottardo,** Museo Civico di Storia Naturale di Ferrara, Via De Pisis 24, I-44100 Ferrara, Italy. E-mail: m-gottardo@libero.it.

**Abstract**

The Philippine endemic phasmid *Hermarchus leytensis* Zompro, 1997 is newly recorded from Mindanao island (Mount Apo). Furthermore, egg, nymphal and adult stages are briefly described along with some notes on the life history of the species in laboratory conditions. The female has an 9-instar developmental cycle, and a high total egg production (2375 eggs). The male is still unknown.

**Key words**

Phasmida, Phasmatodea, *Hermarchus leytensis*, morphology, biology, developmental stage, instar, Philippines.

## Introduction

The phasmid *Hermarchus leytensis* was described by Zompro (1997) based upon a single female specimen from Mount Balocaue, in the Philippine island of Leyte. The species has so far never been found after the original description, and represents the only Philippine species currently in the genus *Hermarchus* Stål, 1875, which is primarily restricted to Melanesia (Hennemann & Conle, 2006). Here *H. leytensis* is recorded for the first time from southern Mindanao, where populations occur in montane forest habitats. Beyond the examination of preserved specimens, several eggs were obtained from wild captured females by the Cabale family (Bacolod, Philippines), and rearing took place in order to describe some aspects of the reproductive biology of the species.

Eggs were kept on a layer of humid soil; the insects were reared in ventilated cages in the laboratory. The species taxonomy and scientific nomenclature follow Brock (2007). Abbreviations for collections (according to Evenhuis & Samuelson, 2007): MCFS = Museo Civico di Storia Naturale, Ferrara, Italy; MGC = Marco Gottardo personal collection, Rovigo, Italy; MSNG = Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy.

## *Hermarchus leytensis* Zompro, 1997 (figs 2-4)

*Hermarchus leytensis* Zompro, 1997: 38; Otte & Brock, 2005: 155.

## Material

7♀♀ and several eggs (MGC), ♀(MCFS), ♀(MSNG) Philippines, Mindanao Island, Mt. Apo, 1300m, 27.iii.2006–10.iv.2006, leg. R. Cabale. ♀ and several eggs (MGC) reared by M. Gottardo, origin Mt. Apo.

## Distribution

This species is only known from the Philippine islands of Leyte: Mount Balocaue (Zompro, 1997) and Mindanao: Mount Apo (fig 1).

## Egg (fig 2)

Length: 2.6-3.1mm, width: 2.1-2.4mm, height: 2.3-2.8mm. Shape is circular in lateral aspect, and oval in cross-section. The capsule surface is strongly pitted, with numerous irregular shallow impressions delimited by raised ridges. The micropylar plate is longer than wide, lance-shaped. The internal micropylar plate is closed. The operculum is higher than wide, strongly convex, with a prominent and irregular capitulum. The coloration is variable from greyish brown to dark green, with collar and part of capitulum mid-brown.

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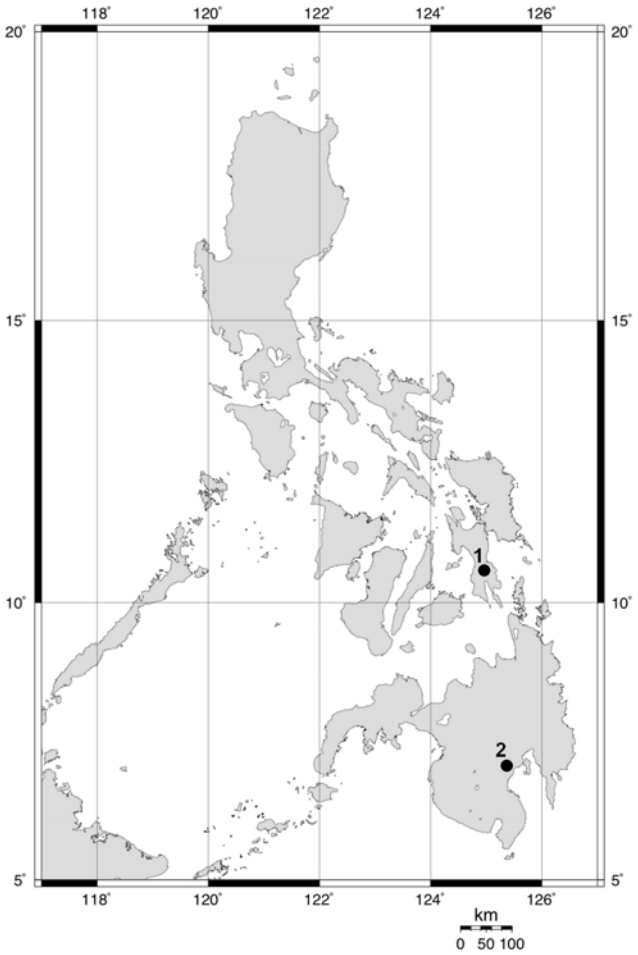


**Figure 1.**
Distribution of *Hermarchus leytensis*
1 – Mount Balocaue, Leyte island;
2 – Mount Apo, Mindanao island.
Map from OMC,
http://www.aquarius.ifm-geomar.de,
accessed January 2008.

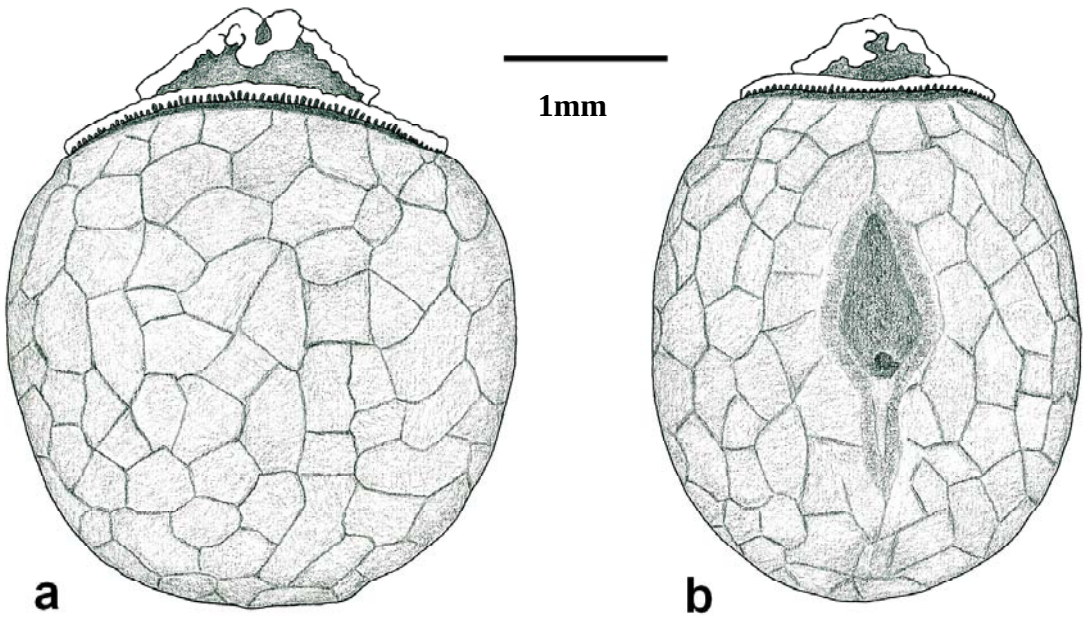


**Figure 2.** Egg of *Hermarchus leytensis*: a – lateral view; b – dorsal view.

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**Nymph** (fig 3)
The first instar nymph is very slender; body length: 13.5-16.2mm. The general colour is yellowish brown. The dorsal surface of head is green, with two mid brown lateral bands. The legs are covered by weakly developed light brown patches. All following instars differ moderately in chromatic characters from previous instar; the body and legs are usually light green. In the female, most of the nymphal development is characterized by a slender habitus (fig 3): the mesothorax is parallel-sided, about four times length of pronotum; the abdominal segments II to VII are clearly longer than wide. However, this condition will not be retained in the adult female. From the sixth instar the mesothorax starts to expand laterally, and the body becomes increasingly broad.

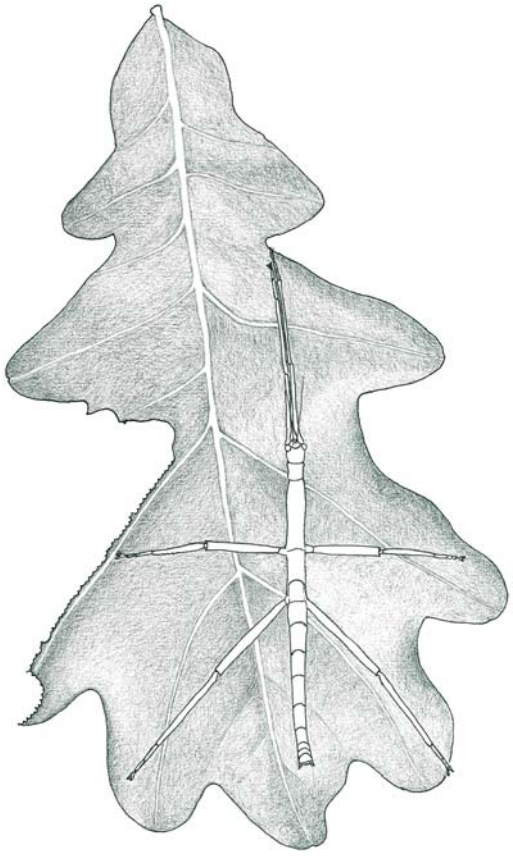

**Figure 3.**
The fourth instar female nymph of *Hermarchus leytensis* at rest on a leaf of *Quercus robur*, an alternative foodplant in rearing conditions.

**Adult** (fig 4)
The female is the only sex known (fig 4). This is a broad phasmid, smooth and glossy in appearance; body length: 127.8-147.6mm (including the subgenital plate). The dorsal and lateral surfaces of the body are mainly apple green, while the ventral surface and legs are slightly darker. The head is strongly globose dorsally; the antennae are dark brown, filiform, longer than fore femora. The mesothorax is still four times length of pronotum, but bell-shaped, essentially broadened in the anterior third. The legs are armed with numerous spines. All abdominal segments are now wider than long, and the lateral margins of tergites are slightly projecting perpendicularly. The abdominal sternite VII is only slightly swollen medioposteriorly, lacking a praeopercular organ. The subgenital plate is keeled and acutely pointed, extending beyond abdominal segment X.

**Notes on the life history of *Hermarchus leytensis* in laboratory conditions**
The duration (in days) of the developmental stages is shown in table 1. Of nine nymphs hatched, only one female was reared to the adult stage. Newly hatched nymphs were active mainly at night, and started to feed about 2-5 days after emergence. At this stage a high mortality rate was observed (about 89%), probably due to the reluctance of the insects to accept an alternative foodplant; also nymphs easily died at temperatures above 30°C. The female has eight nymphal instars; the development of instars lasted from 13-19 days. The female started oviposition 16 days after the final moult, and remained reproductively active

until two days before death; eggs were laid singly, and flicked actively a few metres away from the female. During this period, the female laid a mean of 11.2 eggs per day. However, about 31 days before death a strong decrease in the oviposition rate was observed, with a mean production of six eggs per day: compared with normal eggs, these were smaller, with a larger and broader micropylar plate, and laid mainly with detached opercula. The female produced a total of 2375 eggs during her lifetime.

**Figure 4.** Adult female of *Hermarchus leytensis*, body length 140.9mm.

No data on foodplants in natural habitats are available. In rearing conditions the species feeds on *Hypericum* spp. (Guttiferae), *Quercus* spp. (Fagaceae), *Psidium guajava* (Myrtaceae) and *Rubus ulmifolius* (Rosaceae).

Defensive behaviour: when disturbed the adult female actively used the spinose hind legs to stab. No secretion has been emitted from the prothoracic exocrine glands.

**Table 1.** Duration (in days) of egg, nymphal, and adult stages of *Hermarchus leytensis* over one developmental cycle.

| Stages | Duration (days) | Mean temperature (°C) |
|---|---|---|
| Egg | 112-140 | 25.2 |
| Female, 1st-8th instar nymph | 99 | 25.0 |
| Female, adult (9th instar) | 229 | 22.5 |

## Concluding remarks

Hennemann & Conle (2006) pointed out that *Hermarchus* Stål, 1875 is restricted to the following Pacific islands: Fiji, Tonga, Vanuatu, New Caledonia, New Hebrides and western French Polynesia. Moreover, these authors accommodated all New Guinean species originally described in *Hermarchus* in the new genus *Macrophasma* Hennemann & Conle, 2006. When Zompro (1997) described *H. leytensis*, he linked it to the New Guinean species *Macrophasma lyratus* (Redtenbacher, 1908). However, the female of *H. leytensis* differs from the diagnosis of *Macrophasma* in some characters of the body and egg morphology. Further affinities will be investigated following the identification of the male of this species.

## Acknowledgements

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