

**Maternal care in *Pygoplatys* bugs (Heteroptera: Tessaratomidae)**MATIJA GOGALA<sup>1</sup>, HOI-SEN YONG<sup>2</sup> and CARSTEN BRÜHL<sup>3</sup><sup>1</sup>Prirodoslovni muzej Slovenije, Prešernova 20, P.O. Box 290, SI-1001 Ljubljana, Slovenia;  
e-mail: gogala@uni-lj.si<sup>2</sup>Department of Zoology, University of Malaya, 50603 Kuala Lumpur, Malaysia<sup>3</sup>Zoologie III, Theodor-Boveri-Biozentrum der Universität, Am Hubland, D-97074 Würzburg, Germany**Tessaratomidae, *Pygoplatys*, maternal care, egg guarding**

**Abstract.** Cases of maternal care and egg guarding were observed and photographed in bugs of the family Tessaratomidae. Females of one still undescribed species of *Pygoplatys* from Doi Inthanon, Thailand, and of *Pygoplatys acutus* from Borneo are carrying their young larvae on the venter. The egg guarding was also observed in *Pygoplatys acutus* from Kepong, Peninsular Malaysia. It seems, that maternal care is a characteristic behavior in bugs of the genus *Pygoplatys*.

## Introduction

Parental care at various levels is present in many insect groups. The guarding of eggs and attendance of the early instars probably reduces the levels of mortality during these stages, even in subsocial species which lack any nesting behavior. The parental (and usually maternal) care is known in the orthopteroid orders and in many other groups, e.g. Embioptera, Psocoptera, Thysanoptera, Heteroptera, Homoptera, Coleoptera and Hymenoptera (Tallamy & Wood, 1986). In Heteroptera, cases of maternal egg guarding and early instar attendance have been reported for many terrestrial and some aquatic species (Melber & Schmidt, 1977; Schuh & Slater, 1995). In families Reduviidae and Belostomatidae, cases of paternal care of the young are known (Tallamy & Wood, 1986). Until now, however, the only report of parental care in family Tessaratomidae has been published by Tachikawa (1991, egg guarding in the Japanese species of *Pygoplatys* and *Erga*; after Tallamy & Schaefer, 1997). Recently, we observed similar behavior in some species of genus *Pygoplatys* from Thailand and Malaysia.

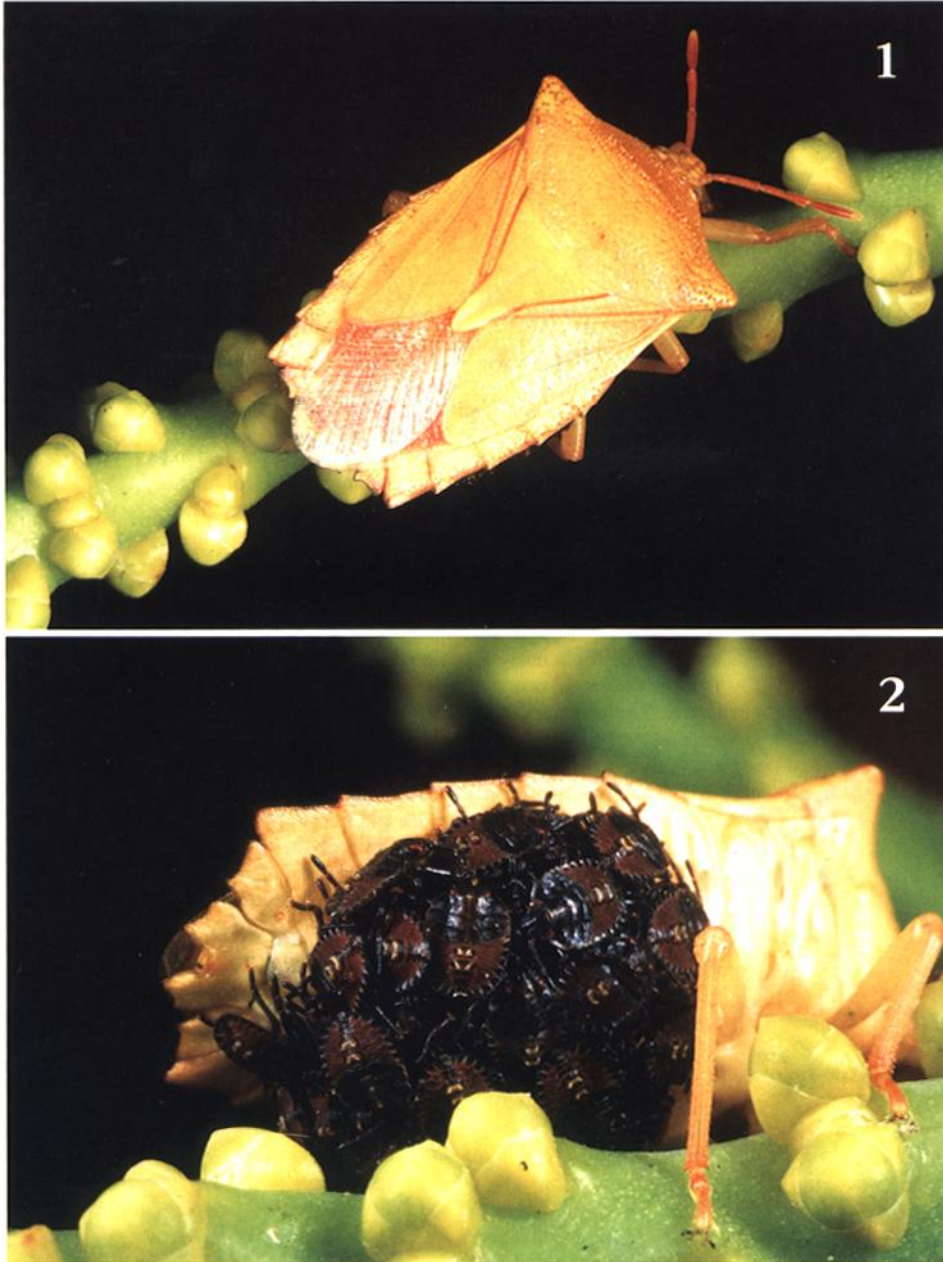
## Observations in Thailand

A tessaratomid female was collected by M. G. on the 8th of April, 1993 by beating vegetation in the Doi Inthanon National Park (at the main road No. 1009 leading from the Junction of the Chiang Mai – Chom Tong highway to Doi Inthanon summit, between the Visitors Center and the Accommodation Center) in a dipterocarp forest, 950 m above the sea level.

The female had on the ventral side of the abdomen a group of small larvae sitting overlapping and forming a flat pile. This female was observed and photographed for a few days in captivity (Figs 1, 2).

During this period of time the larvae (numbering more than 30) never left the body of the adult bug, only crawling slightly around on the ventral side of the abdomen. They usually held firmly on to the female's body and to each other, thus forming a compact flat cluster. The bug was able to crawl, and even fly, with the whole group of young on the belly and without losing them, as we observed both at the collection site and in the hotel room. The larvae did not try to feed on any plants offered to them, as was the case for the female. Unfortunately, we have no idea what might be the appropriate food plant for this species.

The female discussed here was the only adult specimen of this species found during our stay in Thailand. We have not, as yet, been able to identify this species although, according to the available literature



Figs 1–2. 1 – dorsal view of a female *Pygoplatus* sp. from Doi Inthanon, Thailand. Body length of the animal is 18 mm. 2 – ventral side of the same specimen with a cluster of larvae on the abdomen (photo M. Gogala).



Figs 3–4. 3 – *Pygoplatus acutus* from Kepong, Malaysia, sitting on an egg cluster (photo H.S. Yong).  
4 – female of *Pygoplatus acutus* from Borneo with young larvae crawling on her venter (photo C. Brühl).

species of the genus *Pygoplatys*.

A short illustrated report on this interesting behavior has been published previously in Slovene in the popular scientific journal *Proteus* (Gogala, 1994).

#### Observations in Malaysia

A related observation of egg guarding, photographed by the second author (Y.H.S.) concerns a related species, provisionally identified as *Pygoplatys acutus* Dallas, 1851. The female was sitting on the egg cluster (as reported by Tachikawa, 1991) which is known for some members of the family Acanthosomatidae, e.g. *Elasmucha grisea* (cf. Schuh & Slater, 1995). The picture (Fig. 3) was taken in Kepong (Forest Research Institute Malaysia), Selangor Darul Ehsan, Peninsular Malaysia, in October, 1980.

The same behavior was photographed earlier by K.E. Linsenmair in another spectacular *Pygoplatys* species (provisionally identified as *Pygoplatys lancifer* Walker, 1868) from the Deramakot Forest Reserve, Sabah (Borneo) and the illustration was used in his article about parental care in animals in a popular scientific book (König & Linsenmair, 1996, p. 96). He assumed that this species belongs to family Pentatomidae, which is not the case.

The same, or at least a very similar behavior, as seen in *Pygoplatys* from Doi Inthanon was observed and photographed by C.B. in *Pygoplatys acutus*(?) from Borneo. This *Pygoplatys* was found in a primary rain forest in the Maliau Basin, Sabah, during an excursion in 1993. The female bug was discovered in the lower vegetation in an opening, close to the Kuamut river. As in the *Pygoplatys* from Thailand, the larvae were holding on to the adult's body, and only one of them was dislodged while handling the animal for photographic purposes (Fig. 4). The female seemed not to be hindered in her performance by the larvae, although flying was not observed.

The exact identification of the specimens from Malaysia is not possible, as the females guarding the eggs or larvae were not collected. Nevertheless, there is no doubt that they all belong to the family Tessaratomidae.

#### Discussion

Parental care is known in many other species of Pentatomoidea (Melber & Schmidt, 1977; Schuh & Slater, 1995; Tallamy & Schaefer, 1997). In the family Cydnidae where such behavior is widespread, also such benefits as predigestion of food by parental insects (Gogala, unpublished observation on Cydnidae) or a direct transfer of obligatory symbiotic micro-organisms from the adult female to its offspring (Schorr, 1957) are known.

We do not know what the further life history of the offspring of all these *Pygoplatys* species is, nor the reasons for the parental care observed. According to Tallamy & Wood (1986), or Nakamura (1990), who studied another tropical bug species, *Physomerus grossipes* (Coreidae), the presence of a care-taking female can substantially reduce the dangers from predators and parasitoid insects.

It would be worthwhile for one of the biologists living and working in S.E. Asia, where the bugs of the family Tessaratomidae are abundant, to make further observations on one of the *Pygoplatys* species, and contribute to these occasional observations.

ACKNOWLEDGEMENTS. We are grateful to H.I. Griffith (Univ. of Hull, GB) for reading the manuscript, to G. Stonedahl (Entomol. Institute London, now Bellingham, Washington State, USA) for studying the specimens of *Pygoplatys* from D. Inthanon, to P. Chantaramongkol (Chiang Mai University, Thailand) for her great hospitality, and to the Doi Inthanon National Park Headquarters for local support. For the rapid help in providing missing Japanese literature, we are grateful to T. Oba from Chiba, Japan.

#### References

- GOGALA M. 1994: Care of the young in bugs of the family Tessaratomidae. *Proteus* **56**: 266–267 (in Slovenian).
- KÖNIG B. & LINSENMAIR K.E. (eds) 1996: *Biologische Vielfalt*. Spektrum Acad. Publ., Heidelberg, Berlin, Oxford, p. 96.
- MELBER A. & SCHMIDT G.H. 1977: Sozialphänomene bei Heteropteren. *Zoologica* **127**: 19–53.

- MELBER A. & SCHMIDT G.H. 1977: Sozialphänomene bei Heteropteren. *Zoologica* **127**: 19–53.
- NAKAMURA K. 1990: Maternal care and survival in a sumatran bug *Physomerus grossipes*. In Sakagami S.F., Ohgushi R. & Roubik D.W. (eds): *Natural History of Social Wasps and Bees in Equatorial Sumatra*. Hokkaido University Press, Sapporo, pp. 233–243.
- ROLSTON L.H., AALBU R.L., MURRAY M.J. & RIDER D.A. 1993: A catalog of the Tessaratomidae of the world. *Papua New Guin. J. Agric. For. Fish.* **36**: 36–108.
- SCHORR H. 1957: Zur Verhaltensbiologie und Symbiose von *Brachypelta aterrima* Forst. (Cydnidae, Heteroptera). *Z. Morphol. Ökol. Tiere* **45**: 561–602.
- SCHUH R.T. & SLATER J.A. 1995: *True Bugs of the World (Hemiptera: Heteroptera) – Classification and Natural History*. Cornell University Press, Ithaca and London, 336 pp.
- TACHIKAWA S. 1991: *Studies on the Subsociality of Japanese Heteroptera*. Tokyo Agriculture Press, Tokyo, 167 pp. (in Japanese).
- TALLAMY D.W. & SCHAEFER C. 1997: Maternal care in the Hemiptera: ancestry, alternatives, and current adaptive value. In Choe J.C. & Crespi B.J. (eds): *The Evolution of Social Behavior in Insects and Arachnids*. Cambridge Univ. Press, New York, pp. 94–113.
- TALLAMY D.W. & WOOD T.K. 1986: Convergence patterns in subsocial insects. *Annu. Rev. Entomol.* **31**: 369–390.

Received September 10, 1997; accepted November 27, 1997