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The new Southeast Asian goblin spider genus *Aposphragisma* (Araneae, Oonopidae): diversity and phylogeny

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Abstract

The new genus *Aposphragisma* (Araneae, Oonopidae, Oonopinae) comprising the new species *A. baltenspergerae*, *A. borgulai*, *A. brunomanseri*, *A. confluens*, *A. dayak*, *A. dentatum*, *A. draconigenum*, *A. hausammannae*, *A. helvetiorum*, *A. kolleri*, *A. menzi*, *A. monoceros*, *A. nocturnum*, *A. retifer*, *A. rimba*, *A. salewskii*, *A. scimitar*, *A. sepilok* and *A. stannum* is described. It is characterised by very hard bodied, strongly sclerotized species with completely armoured prosoma and strongly sclerotized ventral and dorsal abdominal scuta. *Aposphragisma* gen. nov. is placed within the *Gamasomorpha*-group sensu Saaristo (2001). Descriptions and illustrations are given for all new species. A phylogenetic analysis based on 40 characters using *Prethopalpus fosuma*, *Gamasomorpha asterobothros*, *G. cataphracta*, *G. seximpressa*, *Xestaspis biflocci*, *X. kandy* and *X. paulina* as outgroup-taxa and *Cortestina thaleri* (Oonopidae, Sulsulinae) as the root is presented and discussed. Furthermore it is shown that females of *Aposphragisma* gen. nov. possess complex internal genitalia. The members of the new genus are ground-dwelling litter inhabitants restricted to Southeast Asian lowland and montane forests, with more than 60% of the species only known from single localities. They are presumed to be negatively affected by the massive destruction of pristine forest habitats within their range. This work has been conducted within the framework of the Planetary Biodiversity Inventory (PBI) of Oonopidae (see http://research.amnh.org/oonopidae).

Key words: Oonopinae, Sulsulinae, *Cortestina*, *Gamasomorpha*, *Prethopalpus*, *Xestaspis*, new genus, new species, All-Biota Taxon Inventory ABTI, Planetary Biodiversity Inventory PBI, functional morphology, complex female genitalia, restricted species ranges

Introduction

Human activity is adversely affecting the earth's biodiversity at an ever increasing rate (e.g. Dirzo & Raven 2003), particularly in tropical areas (Bradshaw *et al.* 2009). In this context, conservation initiatives are forced to identify and prioritize key elements of global biodiversity in order to effectively allocate limited resources (e.g. Brooks *et al.* 2006, Bradshaw *et al.* 2009). Areas of high endemism are considered of high priority concern for the protection of global biodiversity (e.g. Myers *et al.* 2000, Dirzo & Raven 2003). So far, identification of endemic areas and the

of *Aposphragisma* gen nov.). Bornean forests in particular are affected by systematic, concession-based logging, habitat conversion and land-use change (McMorrow & Talip 2001, Achard *et al.* 2002, Curran *et al.* 2004). Furthermore, logging has encroached into protected areas (Curran *et al.* 2004). Conversion of logged areas into plantations, especially oil palm, has increased significantly (e.g. McMorrow & Talip 2001, Turner & Foster 2009). A study in northern Borneo showed that leaf-litter dwelling arthropod abundance and biomass was more than 70% lower in oil palm plantations compared to primary forests (Turner & Foster 2009). Some areas in Southeast Asia experiencing high losses of pristine habitats have shown high rates of regional extinction. For example in Singapore, Brook *et al.* (2003) detected an overall loss of biodiversity of at least 28%, but estimated a possible total loss of 73%, with species restricted to forested habitats being particularly affected. The status of many leaf-litter dwelling arthropods in large parts of Southeast Asia can therefore be assumed as critical, as is the case for overall biodiversity (Brook *et al.* 2003, Sodhi *et al.* 2004, Woodruff 2010).

Given the presumably large proportion of undescribed arthropod taxa (May 2000, Hamilton *et al.* 2010), many, including oonopids, may go extinct before being formally described. This highlights the importance of existing museum collections in providing a baseline for the assessment of historical arthropod diversity and a basis for All-Biota Taxon Inventories such as the oonopid PBI. Inventories such as this provide a sound footing for current and future taxonomy, biodiversity research and conservation priority setting.

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