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Seven new species of *Psechrus* and additional taxonomic contributions to the knowledge of the spider family Psechridae (Araneae)

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Abstract

Seven new *Psechrus* species are described from South East Asia: *P. arietinus* **sp. nov.**(♂♀, Vietnam), *P. insulanus* **sp. nov.**(♂, Thailand), *P. ampullaceus* **sp. nov.**(♂♀, Vietnam), *P. omistes* **sp. nov.**(♂, Indonesia, Sumatra), *P. quasillus* **sp. nov.**(♂♀, Malaysia, Borneo), *P. huberi* **sp. nov.**(♀, Philippines), and *P. wade* **sp. nov.**(♂, Philippines). For the following species, new records are listed and intraspecific variation is discussed and illustrated: *P. libelti* Kulczyński, 1908, *P. norops* Bayer, 2012, *P. rani* Wang & Yin, 2001, *P. khammouan* Jäger, 2007, *P. luangprabang* Jäger, 2007, *P. jaegeri* Bayer, 2012, *P. obtectus* Bayer, 2012, *P. kenting* Yoshida, 2009 and *P. crepido* Bayer, 2012, and *Fecenia protensa* Thorell, 1891. The latter species is recorded from Vietnam for the first time. *P. norops*, *P. libelti* and an unidentified *Psechrus* species from Baluno, Mindanao are for the first time characterised and illustrated by their pre-epigynes and pre-vulvae.

Key words: Taxonomy, pre-epigyne, pre-vulva, intraspecific variation, copulatory organs, India, Vietnam, Laos, Thailand, Malaysia, Indonesia, Philippines

Introduction

The spider family Psechridae has been revised several times (Levi 1982; Wang & Yin 2001; Bayer 2011, 2012). In the latest revisions of *Fecenia* Simon, 1887 (Bayer 2011) and *Psechrus* Thorell, 1878 (Bayer 2012), both genera have been revised on a worldwide basis. Nevertheless, the state of knowledge on many species is incomplete and questions remain. In some species structural intraspecific variation of female copulatory organs is remarkably high, for example in *Psechrus khammouan* Jäger, 2007 the respective variants were considered to belong to the same species (Bayer 2012), but, due to the lack of material, without 100% certainty. On the other hand there are species showing remarkable similarities to others distributed nearby. So the question arises, "Do both forms belong to one and the same species?", e.g. *Psechrus taiwanensis* Wang & Yin, 2001 and *P. kenting* Yoshida, 2009. In most cases the uncertainty is due to the lack of sufficient numbers of specimens of both sexes. Only relatively low numbers of specimens have been available from countries/islands such as India, Vietnam, Cambodia, the Greater Sunda Islands and the Philippines. In the last few years, additional material has become available from countries/islands listed above. Several previously unknown forms of *Psechrus* are now recognised, described and as far as possible assigned to one of the eight *Psechrus* species groups established by Bayer (2012). These species groups are based mainly on characters of the copulatory organs (but also upon several somatic characters, such as the spination of the dorsal tibia III and IV, the colouration of the carapace or the relative length of the legs) (Bayer 2012). Besides the *Psechrus* specimens, one *Fecenia protensa* Thorell, 1891 female from Vietnam showing special morphological features became available. Some species investigated herein were (additionally) represented by subadult females. Bayer (2011, 2012) suggested that species discrimination based on primordial female copulatory organs (pre-epigynes/pre-vulvae) is possible for *Fecenia* species and may be possible for *Psechrus* species as well. Therefore, besides the adult material, this study also focusses on subadult females.

Material and methods

Most of the spider material examined in the present study was borrowed from natural history museums (listed below) or was provided by colleagues, who collected specimens in different regions of SE Asia. Specimens were examined and drawn under a Leica M 165 C stereomicroscope with a drawing mirror. Photos of preserved spiders and copulatory organs were taken with a Sony DSC W70 compact camera via an ocular of the stereomicroscope. The material was preserved in 70% denatured ethanol. Before the dissection of the female copulatory organs they were cleared of surrounding hairs. The opaque tissue surrounding the vulva was removed in order to have the best possible view on the different vulva-structures. Vulvae were cleared in 96% DL-lactic acid ($C_3H_6O_3$). As the cuticula surrounding the epigyne may curl and structures may get deformed in the course of using lactic acid, this method could not be applied to every specimen. Unfortunately, other clearing-methods (e.g. clove oil or KOH) were not successful in Psechridae. In males the cymbial hairs of areas close to the bulb were removed so that all the cruical structures could be clearly viewed.

All measurements and all numbers listed next to the scale bars are in millimetres (mm). For the present study the "opisthosoma length" excludes spinnerets and petiolus. Leg formula (from longest to shortest leg) and leg

retrolatero-distally on the palpal tibia. At this position *Psechrus* shows a bundle of long, strong hairs (see Figs 26B–C, 27F of male palps before preparation). In several species such hairs also appear ventro-distally or ventrally and ventro-distally on the palpal tibia. In males of the *mulu*-group tibial processes (again?) appear, either ventro-distally or retrolatero-distally (Levi 1982; Bayer 2012). The latter situation is exhibited by *P. ulcus* Bayer, 2012. It is not understood if this tibial process is homologous to the RTA (regain of RTA) or if it represents an independently evolved process; it lacks the strongly sclerotised and dark sections possessed by most of the "regular" RTAs in spiders of the 'RTA -clade'.

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