



Zootaxa 2377: 1–93 (2010)
www.mapress.com/zootaxa/

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Monograph

ISSN 1175-5326 (print edition)

ZOOTAXA

ISSN 1175-5334 (online edition)

ZOOTAXA

2377

The coelotine spiders from three national parks in Northern Vietnam (Araneae, Amaurobiidae)

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Magnolia Press
Auckland, New Zealand

Accepted by J. Miller: 15 Feb. 2010; published: 26 Feb. 2010

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(*Zootaxa* 2377)

93 pp.; 30 cm.

26 February 2010

ISBN 978-1-86977-493-6 (paperback)

ISBN 978-1-86977-494-3 (Online edition)

FIRST PUBLISHED IN 2010 BY

Magnolia Press

P.O. Box 41-383

Auckland 1346

New Zealand

e-mail: zootaxa@mapress.com

<http://www.mapress.com/zootaxa/>

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ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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Abstract

Twenty three coelotine species from Northern Vietnam, including twenty one new species, are described and illustrated: *Coelotes acerbus* **sp. nov.**; *C. furvus* **sp. nov.**; *C. perbrevis* **sp. nov.**; *C. polyedricus* **sp. nov.**; *C. songae* **sp. nov.**; *Draconarius clavellatus* **sp. nov.**; *D. cucphuongensis* **sp. nov.**; *D. ellipticus* **sp. nov.**; *D. hanoiensis* Wang & Jäger, 2008; *D. longissimus* **sp. nov.**; *D. magicus* **sp. nov.**; *D. pseudoclavellatus* **sp. nov.**; *D. pseudopumilus* **sp. nov.**; *D. pumilus* **sp. nov.**; *D. rimatus* **sp. nov.**; *D. rotulus* **sp. nov.**; *D. tamdaoensis* **sp. nov.**; *D. transparentis* **sp. nov.**; *D. transversus* **sp. nov.**; *D. volubilis* **sp. nov.**; *Notiocoelotes pseudovietnamensis* **sp. nov.**; *N. parvitriangulus* **sp. nov.**; *Orumceki*a *libo* (Wang, 2003). Photos of all twenty three species are provided. All specimens are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing (IZCAS).

Key words: Taxonomy, diagnosis, morphology, pitfall traps, leaf-litter sieving

Introduction

Vietnam stretches more than 1650 kilometers from north to south along Tonkin Bay and the South China Sea, encompassing three major biogeographic zones, four Endemic Bird Areas (EBAs), and a wide variety of unique habitats. Because of its size, location, and the historical interaction of complex topographic, climatic and ecological factors, the country has high levels of species diversity and endemism. The spiders of Vietnam have been studied in recent years (Ono 2002, 2003, 2004a, 2004b; Peng & Li 2003; Tu & Li 2004, 2006; Gris-mado & Ramírez 2004; Jäger 2003; Jäger & Vedel 2005; Wang & Jäger 2008; Wang, Xu & Li 2008). Lots of new species and newly recorded species were reported. A total 320 spider species and one subspecies were recorded from Vietnam, belonging to 32 families and 159 genera. Among them, 152 species and one subspecies are endemic to Vietnam (Pham *et al.* 2007). There were only four coelotine species recorded from Vietnam, they are, *Draconarius hanoiensis* Wang & Jäger, 2008, *D. houngsonensis* Wang & Jäger, 2008, *Notiocoelotes vietnamensis* Wang, Xu & Li, 2008, and *Orumcekia gemata* (Wang, 1994). The first Vietnamese coelotine, *C. yoshikoae* was reported by Nishikawa (1995), which was later placed as a junior synonym of *O. gemata* (Wang, 1994) by Wang (2002). The study on Vietnamese coelotine spiders was obviously limited. It is expected that more coelotine spiders exist in Vietnam.

An extensive faunal survey of spiders from three national parks (Cuc Phuong National Park, Cat Ba National Park and Tam Dao National Park) in Northern Vietnam over a period of one year using various collection techniques (ground pitfall traps, leaf-litter sieving, canopy fogging and direct search) was carried out by the colleagues of the Chinese Academy of Sciences and Vietnamese Academy of Science and Technology. The collections included 967 adult coelotine spiders representing 23 species, belonging to four genera (*Coelotes*, *Draconarius*, *Notiocoelotes* and *Orumcekia*), with *Draconarius* and *Coelotes* being the most dominant genera, and with *D. pumilus* **sp. nov.** (304 adult individuals) and *C. polyedricus* **sp. nov.** (40 adult individuals) being the most dominant species of each genus respectively. Among of these 23 species, 21 species are new species, 15 species were collected with only male or female, three species were represented by only one specimen (singletons) (*C. songae* **sp. nov.**; *D. hanoiensis*; *O. libo*). Of these 23 species, one was unique to Cat Ba National Park, seven to Cuc Phuong National Park, 12 to Tam Dao National Park, three species (*D. longissimus* **sp. nov.**; *D. transversus* **sp. nov.**; *D. volubilis* **sp. nov.**) were distributed in both Cuc Phuong National Park and Tam Dao National Park. All 23 species were described in this paper.

Material and methods

Study area

Total forest cover in Vietnam currently totals 12.3 million ha, of which 10.1 million ha is natural forest and 2.2 million ha is plantations. 36.7% of this forest is protected in National Parks and preserved areas (Wil *et al.* 2006). The study was carried out in three regions: Cuc Phuong National Park, Tam Dao National Park and Cat Ba National Park in Northern Vietnam. These three parks are approximately 160 km apart (Fig. 87).

Cuc Phuong National Park is located from 20°14'–20°24'N and 105°29'–105°44'E, with an area of 22,200 ha. The park is in Ninh Binh Province, at an elevation of 154–636 m above the sea level. It is located at the red river delta with a tropical monsoon climate of stable temperatures and humidity gradient.

Tam Dao National Park is situated from 21°21'–21°42'N and 105°23'–105°44'E, in Vinh Phuc Province, with an area of 36,833 ha and an elevation of 900–1388 m. With typical characteristics of high mountain tropical monsoon climate, this park has high humidity and low temperatures. Precipitation comes in the form of mist and rain, and may be accompanied by strong wind (Do 2001).

Cat Ba National Park differs from other national parks in Northern Vietnam because it is located on an island in Hai Phong Province. Due to the isolated nature of the island, the diversity and abundance of mam-

mals at this park are low compared to other national parks in Vietnam. The park is located from 20°44'–20°51'N and 106°58'–107°10'E, covering an area of 15,200 ha, at an elevation of 25–331 m. This national park is affected by maritime climate with weather fluctuation. In addition, typhoons and tropical storms are frequent in the rainy season (Trinh 1985).

Study methods

Specimens were examined with an Olympus SZ11 stereomicroscope; details were studied with an Olympus BX41 compound microscope. All illustrations were made using an Olympus drawing tube. Male palps and female epigyna were examined and illustrated after being dissected from the spider bodies. Photos were made with an Olympus C7070 wide zoom digital camera (7.1 megapixels) mounted on an Olympus SZX12 Dissecting Microscope. Type specimen photos of the species included in this paper and other related photos can be viewed from Li & Wang (2010).

All measurements were obtained using an Olympus SZ11 stereomicroscope and are given in millimeters. Eye diameters were taken at the widest point. Total body length does not include the length of the chelicerae or spinnerets. Leg measurements are given as: Total length (femur, patella + tibia, metatarsus, tarsus). The terminology used in text and figure legends follows Wang (2002) and Wang *et al.* (2008). Abbreviations used in text and figure legends: ALE = anterior lateral eye; AME = anterior median eye; At = atrium; AME–ALE = distance between AME and ALE; AME–AME = distance between AMEs; ALE–PLE = distance between ALE and PLE; AS = atrial scape; CD = copulatory duct; CDA = conductor dorsal apophysis; CF = cymbial furrow; Co = conductor; EB = embolic base; Em = embolus; ET = Epigynal teeth; FD = fertilization duct; LTA = lateral tibial apophysis; MA = median apophysis; PA = patellar apophysis; PLE = posterior lateral eye; PME = posterior median eye; PME–PLE = distance between PME and PLE; PME–PME = distance between PMEs; RTA = retrolateral tibial apophysis; S = spermatheca; SH = spermathecal head; ST = subtegulum; T = tegulum; TS = tegulum sclerite.

All types of the new species are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing (IZCAS).

Taxonomy

Family Amaurobiidae Thorell, 1870

Subfamily Coelotinae F.O.P. –Cambridge, 1893

Genus *Coelotes* Blackwall, 1841

Diagnosis. Females resemble *Eurocoelotes* but have laterally situated epigynal teeth, a reduced atrium, and short copulatory ducts. Males also resemble *Eurocoelotes* in having a conductor dorsal apophysis and a short, rounded median apophysis, but have a broad patellar apophysis (Wang 2002).

Distribution: Europe, Middle Asia, East Asia.

Coelotes acerbus sp. nov.

Figs 1–4, 87

Type material. Holotype male, 2 male paratypes, VIETNAM: Ninh Binh Province, Cuc Phuong National Park (20°21.44'N, 105°34.21'E), March 2007 to March 2008, Dinh-Sac PHAM leg.

Etymology. The specific epithet is taken from the Latin adjective '*acerbus*', referring to the sharp distal end of cymbial furrow.

Diagnosis. This new species can be distinguished from other *Coelotes* species by the distinctly large conductor and strongly modified, broad patellar apophysis (Figs 1B, 2A, 3B, 4B).