Description of Bayadera kinnara sp. nov. from Burma, with taxonomic notes on its congeners (Odonata: Euphaeidae)

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Introduction

The genus Bayadera Selys, 1853 includes some 15 recognized species. The genus is most speciose in southern China, from where no less than 11 species are known, 9 of them from continental China. One Bayadera species, B. fasciata Sjöstedt, 1932, is still only known by the female sex. Davies & Yang (1996) described three new Bayadera species from Yunnan and Sichuan: B. serrata, B. strigata and B. nephelopennis. They also provided a brief synopsis of the known Bayadera taxa (13 species and 2 subspecies) recognized at that time and included a key to the males.

Since the publication of Davies & Yang (1996) two new Bayadera species have been described: B. kirbyi Wilson & Reels, 2001 from Hainan (Wilson & Reels, 2001) and B. chittaranjani Lahiri, 2003 from Manipur State in Northeast India (Lahiri, 2003). The generic placement and status of chittaranjani is discussed in the present paper. Also since 1996 the following taxonomic changes have been made in Bayadera. Bayadera vietnamensis Van Tol & Rozendaal, 1995 was first transferred to the genus Schmidtiphaea Asahina, 1978 by Wilson & Reels (2003), and subsequently to the genus Cryptophaea Hämäläinen, 2003 by Hämäläinen (2003). Hämäläinen (2004) upgraded the taxonomic status of B. ishigakiana Asahina, 1964 and B. continentalis Asahina, 1974 from subspecies (of B. brevicuda Fraser, 1928) to full species, and ranked B. melanopteryx Navás, 1934 as synonym of B. melanopteryx Ris, 1912. This synonymy had already been anticipated by several authors.

A new Bayadera species from northern Burma is described here on the basis of a single male specimen from Kachin State, collected during an expedition by a group of Japanese entomologists in 2000. The new species has resemblance with B. serrata, of which species a new record from Vietnam is presented.

Bayadera kinnara sp. nov.

(Figs. 1a, 1b, 1d, 1e)

Type specimens. Holotype ♂, Burma (Myanmar), Kachin State, South Kumon Range, Zhan-Phut (Makoutsup-Hill), altitude ca 600 m, 11- to 15-V-2000, Y. Yamaoka, S. Nagai & H. Miyama leg.

Type depository. Kanagawa Prefectural Museum of Natural History, Odawara, Japan.

Etymology. The specific epithet kinnara (a noun in apposition) refers to the half-human and half-bird character from the Buddhist mythology of many south-east Asian countries. Kinnara are renowned for their skills in dance and song. This is accordance with the meaning of the genus name Bayadera: bayadère is the French version of the Portuguese word bailadeira, which refers to a Hindu dancing girl in Indian temples. Selys Longchamps (1853) introduced the genus-group name Bayadera for his Indian species Epallage indica.
Diagnosis. A Bayadera with superior anal appendages of male bearing a distinct dorsal spine and inferiors reaching well beyond the superiors.

Description of male holotype.
A fully mature male holotype specimen with well developed pruinescence (Fig. 1a).
Head. Labium with middle lobe largely black and sides yellow, lateral lobes yellow, tips black. Labrum, clypeus, base and mandibles and genae olive yellow, this colour extending upward over the anterolateral corners of frons and laterally along the inner margin of each eye to the level of the lateral ocelli. Vertex and occiput matt black, with obscure pale spots at sides of the lateral ocelli. Seen from above the black colour on head forms a triangle shaped figure towards the postclypeus, the apical margin of postclypeus being black in the middle part (Fig. 1b). Frons not projecting; seen from above, the surface of frons almost on the level of surface of genae; frons with very sparse pale yellow hairs. Rear of head pruinose.
Thorax. Prothorax black with sides of middle lobe broadly yellow; lateral corners of anterior and posterior lobe yellow. Sides of prothorax pruinose. Synthorax matt black with yellowish stripes (Fig. 1b). The antehumeral stripe and another broader stripe, which extends across the humeral suture, narrowing and curving backwards dorsad on the mesepimeron, are broadly confluent anteriorly. Along the first lateral suture, a stripe which at apical end turns downwards and covers upper part of metepisternum. Much of metepimeron yellow, the yellow colour forming a triangular shaped patch. Thorax laterally (below the antehumeral stripe) pale bluish pruinose, most heavily along the sutures and infrapleisterna. Underside of synthorax pale, pale bluish pruinose. Coxae black in middle, pruinose on sides. Legs otherwise black, femora pruinose internally.
Wings entirely hyaline (Fig. 1a); pterostigma brown, covering underlying 4-5 cells. R5 begins 0.5 to 1.5 cells distal to the subnodus. Quadrangle entire. Cubital space with 1 crossvein. Antenodals number 17 in fore wing, 15 in hind wing; postnodals correspondingly 22-24 and 20-23.
Abdomen. Black, segment (S) 1 with pale lateral stripe, side and dorsum partly pruinose. S2 with pale lateral stripe, dorsum black but pruinose. S3 with pale lateral stripe, broader at base, extending 4/5th of the length of segment. S4-7 with a pale baso-lateral spot; S4 also with a faint, narrow lateral stripe extending 2/3rd of the length of segment. S8 with only a tiny pale spot at base, S9-10 all black. Venter of abdomen black, slightly pruinose from the apical end of S4 to the tip of abdomen.
Anal appendages (Figs. 1d & 1e) black, the superiors curling strongly downwards and inwards, about the length of segment 9 and twice the length of segment 10. Interiorly, 1 mm away from the base a robust spine directed mesad and upward, projecting about 0.5 mm. In lateral view superior supporting subapically a thin, asymmetrically broadly rounded, ventral flap, with inferior margin minutely serrate; apex narrowed. Inferior appendages in lateral view reaching well beyond to the tips of superiors, subcylindrical, slightly divergent, tapered; the pointed apices directed slightly mesad.
Penile organ of the typical shape for the genus, similar to that of B. serrata (cf. Fig. 2).
Measurements (mm). Fore wing 38.0, hind wing 36.0, abdomen (incl. appendages) 44.5.

Female. Unknown.

Differential diagnosis. Among those earlier described Bayadera species for which the male sex is known, only B. serrata Davies & Yang, 1996 has a robust dorsal spine on the superior appendages and superior appendages which are curved strongly downwards. B. serrata was described on the basis of a single mature male, collected in Dali, Yunnan.
I have not studied this holotype specimen (see Fig. 2, copied from the original description), but I have specimens from northern Vietnam available [3 mature ♂, Vietnam, Cao Bang province, Pia Oac, Nguyen Binh, 23-V-2010, Do Manh Cuong leg.; see Figs. 1c, 1f & 1g], which I have provisionally identified as B. serrata. The following comparison is based on both of the original description of serrata and these specimens. B. kinnara differs from serrata by its clearly longer inferior appendages (Figs. 1d & 1f). The dorsal spine of the superiors of kinnara is slightly less prominent than in serrata. In kinnara the apical part of the superiors, seen in lateral view, is less expanded and more distinctly grooved in the inner surface than in serrata. In serrata the apex has a ‘bird’s head’ shape. In kinnara the inferior margin of the apical part of the superiors is less conspicuously serrated than in serrata. There are also small differences in the colour.
Fig. 1. *Bayadera kinnara* sp. nov. (a, b, d, e) and *Bayadera serrata* (Vietnam, Cao Bang) (c, f, g). a. habitus of holotype male of *B. kinnara* sp. nov.; b, c. head and thorax; d, f. male anal appendages in lateral view; e, g. oblique dorsal view.

Note: Fig. 1d is a mirror image, the partly detached superior appendage being behind; in Fig. 1e the other superior appendage is partly detached at base.
pattern (Figs. 1b & 1c). In *kinnara* the sides of the prothorax are broadly yellow, in *serrata* holotype (also a mature male) the prothorax is largely black with restricted pale spots. In *kinnara* there is a complete yellowish stripe along the first lateral suture, in *serrata* this stripe is restricted to a short mark in the dorsal part of the metepisternum near the wing base. The Vietnamese specimens differ from the description of *serrata* holotype by the abdominal segment 9 having a distinct yellowish spot. Otherwise the colour pattern is similar.

It should be mentioned here that Mr Noppadon Makbun has collected a series of teneral *Bayadera* specimens of both sexes at Doi Inthanon in Chiang Mai province in northern Thailand. In these specimens the male anal appendages also resemble closely those of *serrata*, but the colour pattern of thorax is somewhat different, perhaps due to the age. The colour pattern of head and thorax is quite similar in both sexes. These specimens will be discussed further when mature specimens become available in the future.

The only *Bayadera* species for which the male sex is unknown is *B. fasciata* Sjöstedt, 1932 from north-east Sichuan. Sjöstedt’s (1932) description and illustrations of the female holotype, copied here as Fig. 3, show that the colour pattern of the head and thorax of *B. fasciata* differ markedly from that of *B. kinnara* and *B. serrata*.

**Taxonomic notes on Bayadera chittaranjani Lahiri, 2003**

Lahiri (2003) described *B. chittaranjani* based on a male specimen collected from Chandel district in Manipur, North-east India. Some details in the description, such as the relative lengths of abdomen (53.0 mm) and hind wing (35.0 mm) suggest the species might be placed in *Schmidtiphaea* rather than a *Bayadera*. Lahiri’s description includes illustrations of anal appendages and genitalia, but the wings were not figured. Due to courtesy of Dr. K. A. Subramanian I received photographs of the holotype specimen preserved at NZC, Kolkata. The photos show that in *chittaranjani* the fore and hind wings are equally long, with the pterostigma in the hind wing situated abnormally apical. These two characters are unique in the family, and enable an easy way to separate the genus *Schmidtiphaea* from *Bayadera* and other euphaeid genera (Hämäläinen, 2003). Therefore I propose the following new combination:

*Schmidtiphaea chittaranjani* (Lahiri, 2003), comb. nov.

Unfortunately, the holotype male (and single known specimen) of *Schmidtiphaea schmidi* Asahina, 1978 lacks the anal appendages. At the time when the species was described, only fragments of the appendages were left (see Asahina 1978, p. 44, fig. 1). Now even these fragments no longer exist. Therefore it is not possible to compare the appendages of *schmidi* and *chittaranjani*. The general colour pattern of these taxa seems to fit, but there are some differences in the
descriptions of the colour of the head. These might depend on the state of preservation or age of the specimen.

The type localities of *schmidtii* (Huiahu, 3,800-5,000 ft, Manipur) and *chittaranjani* (15 km south of Chandel, Manipur) are located along the same mountain range, and their distance is only ca 120 km apart. Although this seems to suggest a strong possibility of these two species are the same, I refrain of making further taxonomic decisions until further material becomes available and the male appendages of both can be compared.

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**References**


摘 要：Matti Hämäläinen：ビルマ北部から得られた *Bayadera* 属の新種記載と同属種の検討。ビルマ北部カチン州から得られた *Bayadera* 属の新種 *Bayadera kinnara* sp. nov. を記載した。この種は、中国雲南省から記載された *B. serrata* に近縁であるが、オス尾部付属器の形状などから区別される。また *B. serrata* をベトナムから初めて記録した。加えてインドから記載された *Bayadera chittaranjani* を *Schmidtiphaea* 属に移し、*Schmidtiphaea chittaranjani* comb. nov. とした。