

## FIRST COLOURED SPECIES OF THE GENUS *THABENA* STÅL (HEMIPTERA, FULGOROIDEA, ISSIDAE) FROM VIETNAM WITH GENERAL NOTES ON THE GENUS

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A new species of the genus *Thabena* Stål, 1866 is described from Dalat in Vietnam. Checklist of *Thabena* species is given. This is the first species of the genus with multicoloured metope which may be treated as a kind of mimicry to salticid spiders. Taxonomic position of the genus *Thabena* within the family Issidae and its close relationships to the tribe Parahiraciini is briefly discussed.

Key words: Issini, Parahiraciini, Caliscelidae, *Chlamydopteryx*, *Lasonia*, *Redarator*, *Thabena*, morphology, evolution, mimicry, taxonomy, new species.

### INTRODUCTION

The genus *Thabena* Stål, 1866 (= *Gelastyra* Kirkaldy, 1904; = *Gelastyrella* Yang, 1994; = *Borbonissus* Bonfils, Attié et Reynaud, 2001) *sensu* GNEZDILOV (2009) belongs to the tribe Issini Spinola and it is endemic to Southeastern Asia with 14 species, including the species described below, known from China, Indonesia, Malaysia, Myanmar, Reunion I., Singapore, Taiwan, and Vietnam (GNEZDILOV 2009, 2013, GNEZDILOV *et al.* 2014a, CHAN *et al.* 2013, BOURGOIN 2015). Two species are recorded from outside of native distribution – *Thabena brunneifrons* (Bonfils, Attié et Reynaud, 2001) was apparently imported from Asia to Réunion Island (France) and Rodrigues Island (Republic of Mauritius) in historic time (GNEZDILOV 2009, 2013), and *Thabena fissala* (Fieber, 1876) was described from Portugal possibly due to label error (GNEZDILOV *et al.* 2011).

Type locality of the species described below, Dalat, is capital of Lam Dong Province situated at about 1500 m a.s.l. on Langbian Plateau in the southern part of the Central Highlands region of Vietnam.

As reported by the recently published list of Vietnamese Issidae (GNEZDILOV *et al.* 2014a) just one species of the genus, *Thabena litaoensis* Yang, 1994 is recorded so far from Vietnam, in Hoa Binh Province.

According to our study of type specimens and original descriptions none of the described species of the genus *Thabena* possesses such peculiar red brownish metope with black glossy spots as the species described below. Typically the metope of other *Thabena* species is brown or dark brown sometimes with black band below its upper margin (GNEZDILOV 2009, fig. 3, CHAN

*et al.* 2013, figs 12–15) but never multicoloured. However, morphologically the new species doubtlessly belongs to the genus *Thabena*. Unfortunately, it is still difficult to give a key to species of the genus as some of them are only known after females.

## MATERIAL AND METHODS

Morphological terminology generally follows ANUFRIEV and EMELJANOV (1988) and GNEZDILOV *et al.* (2014b), except BOURGOIN *et al.* (2014) for fore wing venation.

The holotype of the species described below is deposited in the Hungarian Natural History Museum, Budapest, Hungary.

The photos were taken by Leica MZ 95 with camera Leica DFC 290 and then assembled with Helicon Focus 5.3 and Adobe Photoshop CS6. The drawings were made with a Leica MZ95 stereo microscope.

## CHECKLIST OF *THABENA* SPECIES

### *Thabena* Stål, 1866

*Thabena* Stål, 1866a: 208. Type species: *Issus retractus* Walker, 1857, by subsequent designation (StÅL 1866b: 393).

*Cibyra* Stål, 1861: 209 (preoccupied). Type species: *Issus testudinarius* Stål, 1854 (= *Issus spectans* Walker, 1858), by original designation.

Syn.: *Gelastyra* Kirkaldy, 1904: 280 (new name for *Cibyra* Stål, 1861) (Type species: *Issus spectans* Walker, 1858, syn. of *Issus testudinarius* Stål, 1854) fide GNEZDILOV 2009: 77.

Syn.: *Gelastyrella* Yang, 1994 in CHAN & YANG 1994: 90 (Type species: *Gelastyrella litaoensis* Yang, 1994 in CHAN & YANG 1994) fide GNEZDILOV 2009: 77.

Syn.: *Borbonissus* Bonfils, Attié et Reynaud, 2001: 217 (Type species: *Borbonissus brunnifrons* Bonfils, Attié et Reynaud, 2001) fide GNEZDILOV 2009: 77.

### *Thabena biplaga* (Walker, 1851)

*Issus biplaga* Walker, 1851: 367.

*Gelastyra biplaga* FENNAH 1956: 511.

*Thabena biplaga* GNEZDILOV 2009: 79.

Distribution – China (Hong Kong I.) (WALKER 1851, FENNAH 1956, GNEZDILOV 2009).

Note – Described after the female from Hong Kong I. (WALKER 1851, GNEZDILOV 2009). Habitus is illustrated by FENNAH (1956).

### *Thabena brunnifrons* (Bonfils, Attié et Reynaud, 2001)

*Borbonissus brunnifrons* Bonfils, Attié et Reynaud, 2001: 218.

*Thabena brunnifrons* Gnezdilov 2009: 79.

Distribution – Reunion I. (France), Rodrigues I. (Republic of Mauritius), Singapore, Taiwan including Dongsha (Pratas) I. (ATTIÉ *et al.* 2005, 2008, BONFILS *et al.* 2001, GNEZDILOV 2009, CHAN *et al.* 2013).

Note – Described from Reunion Island in Indian Ocean after males and females (BONFILS *et al.* 2001). Habitus of adult and 5th instar larva and male genitalia are illustrated (BONFILS *et al.* 2001, CHAN *et al.* 2013). Host plants are listed, the species is recorded as polyphagous occurring on plants from 22 dicotyledon families (BONFILS *et al.* 2001, ATTIÉ *et al.* 2005, 2008, CHAN *et al.* 2013).

### *Thabena decipiens* (Melichar, 1906)

*Gelastyra decipiens* Melichar, 1906: 264.

*Thabena decipiens* GNEZDILOV 2009: 80.

Distribution – Malaysia (MELICHAR 1906; GNEZDILOV 2009).

Note – Described after the female from Perak in Malaysia (MELICHAR 1906). No illustrations were published.

### *Thabena diversa* (Melichar, 1906)

*Gelastyra diversa* Melichar, 1906: 263.

*Thabena diversa* GNEZDILOV 2009: 80.

Distribution – Myanmar (MELICHAR 1906; GNEZDILOV 2009).

Note – Described after the female from Thagata in Myanmar (MELICHAR 1906). No illustrations were published.

### *Thabena fissala* (Fieber, 1876)

*Issus fissala* Fieber, 1876: 259 [separata 1876: 249].

*Thabena fissala* GNEZDILOV, SOULIER-PERKINS & BOURGOIN 2011: 29.

Note – Described after a male (or males) from Portugal (FIEBER 1876). Native distribution is unknown. Illustrations published by GNEZDILOV *et al.* (2011).

### *Thabena frontocolorata* sp. n.

Distribution – Vietnam.

### *Thabena lanpingensis* Zhang et Chen, 2012

*Thabena lanpingensis* Zhang et Chen, 2012: 229.

Distribution – China (Yunnan) (ZHANG & CHEN 2012).

Note – Described after males and females, illustrated (ZHANG & CHEN 2012).

*Thabena latifrons* (Melichar, 1906)

*Gelastyra latifrons* Melichar, 1906: 264.

*Thabena latifrons* GNEZDILOV 2009: 80.

Distribution – Myanmar, Indonesia (Sumatra I., Mentawai Islands, Sipora I.) (MELICHAR 1906).

Note – Described after males and females from Myanmar and Indonesian islands (MELICHAR 1906). The type series have to be examined and the lectotype has to be designated.

*Thabena litaoensis* (Yang, 1994)

*Gelastyrella litaoensis* Yang, 1994: 90 in CHAN & YANG 1994.

*Thabena litaoensis* GNEZDILOV 2009: 80.

Syn: *Gelastyrella hainanensis* Ran et Liang, 2006: 65, syn. fide GNEZDILOV *et al.* 2014a: 88.

Distribution – China (Hainan I., Fujian, Guangxi) (RAN & LIANG 2006, ZHANG & CHEN 2012, CHEN *et al.* 2014), Vietnam (GNEZDILOV *et al.* 2014), Taiwan (CHAN & YANG 1994).

Note – Described after the males and female from Taiwan (CHAN & YANG 1994). Illustrations published by HORI (1970: as *Gelastyra testudinaria*), CHAN and YANG (1994), RAN and LIANG (2006), ZHANG and CHEN (2012), and CHAN *et al.* (2013).

*Thabena literosa* (Walker, 1857)

*Issus literosus* Walker, 1857: 154.

*Tetrica literosa* DISTANT 1909: 84.

*Thabena literosa* GNEZDILOV 2009: 80.

Distribution – Malaysia (Sarawak) (WALKER 1857).

Note – Described after the male from Sarawak (WALKER 1857, comments by GNEZDILOV (2009)). No illustrations are published.

*Thabena ovalis* (Walker, 1857)

*Issus ovalis* Walker, 1857: 154.

*Tetrica ovalis* DISTANT 1909: 84.

*Thabena ovalis* GNEZDILOV 2009: 80.

Distribution – Malaysia (Sarawak, Sabah) (WALKER 1857, GNEZDILOV 2009).

Note – Described after the male from Sarawak (WALKER 1857, comments by GNEZDILOV (2009)). Collected from *Cocoa* leaves and Malaise trap (GNEZDILOV 2009). No illustrations are published.

*Thabena retracta* (Walker, 1857)

*Issus retractus* Walker, 1857: 152.

*Thabena retracta* STÅL 1866b: 393.

*Thabena retracta* GNEZDILOV 2009: 78.

Distribution – Malaysia (Sarawak, Sabah), Singapore (WALKER 1857, GNEZDILOV 2009).

Note – Described after the male from Borneo without locality indication (WALKER 1857, comments by GNEZDILOV (2009)). The holotype and male genitalia of the species after the specimen from Sarawak are illustrated by GNEZDILOV (2009).

*Thabena testudinaria* (Stål, 1854)

*Issus testudinarius* Stål, 1854: 246.

Syn: *Issus spectans* Walker, 1858: 91, syn. fide STÅL 1870: 756.

*Gelastyra testudinaria* METCALF 1958: 430.

*Thabena testudinaria* GNEZDILOV 2009: 83.

Distribution – Malaysia (Penang I.) (STÅL 1854).

Note – Described after the female from Pulo Penang (STÅL 1854). No illustrations of type specimen are published. The record of the species from Taiwan (HORI 1970) belongs to *T. litaoensis*. Records from Indonesia (Java) (WALKER 1858, GNEZDILOV 2009) and Philippines (STÅL 1870) need verification.

*Thabena yunnanensis* (Ran et Liang, 2006)

*Gelastyrella yunnanensis* Ran et Liang, 2006: 67.

*Thabena yunnanensis* GNEZDILOV 2009: 83.

Distribution – China (Yunnan) (RAN & LIANG 2006).

Note – Described after male and female, illustrated (RAN & LIANG 2006).

## DESCRIPTION OF THE NEW SPECIES

***Thabena frontocolorata* sp. n.**

(Figs 1–3, 7, 8)

Type material – Holotype, ♂, Vietnam, Da Lat, “Institute of Biology”, 5.XII.1994, “No. 709”, S. Mahunka, Gy. Sziráki & L. Zombori leg.

Etymology – The species named according to the coloured metope (frons).

Description – Metope wide, glossy, lateral margins convex, upper margin widely concave (Fig. 2). Metope with distinct transverse and median carinae; sublateral carinae may be indicated only after the traces. Metopoclypeal suture relief. Postclypeus large, flattened

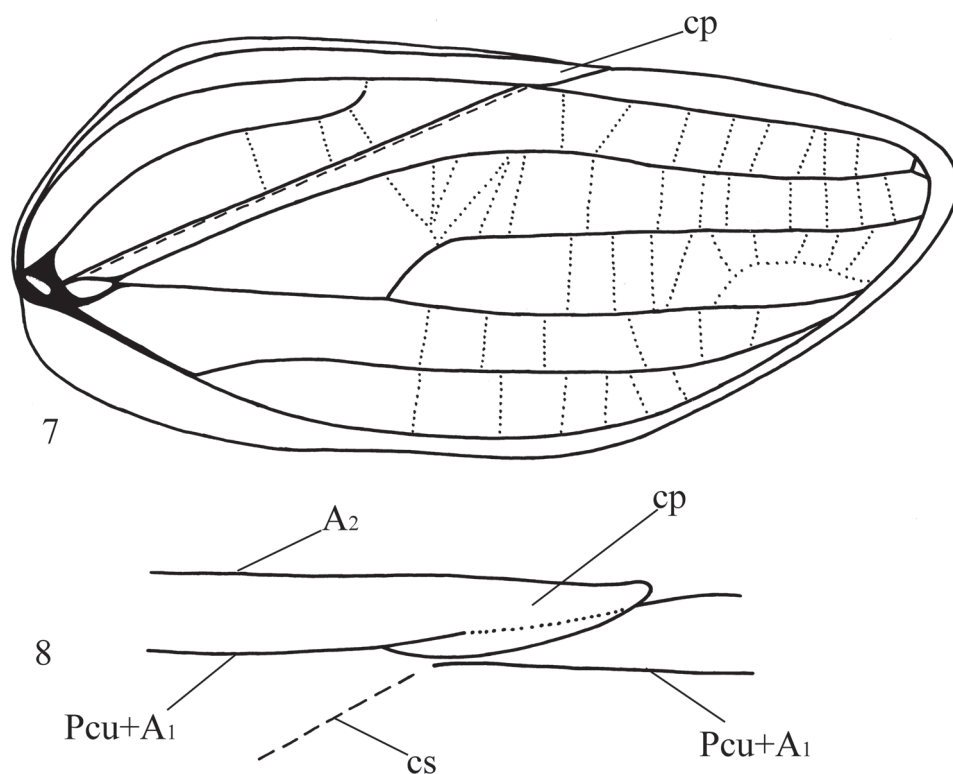
dorso-ventrally, glossy. Ocelli absent. Coryphe transverse, without carina; anterior margin obtusely angulately convex; posterior margin obtusely angulately concave. Fore wings nearly oval, narrowing apically, without hypocostal plate (Figs 1, 7). Caudo-dorsal angle of clavus cuspidal (Fig. 8). ScP+R furcating in proximal half of the wing into ScP+RA and RP; MP 2-branched, furcating near to wing middle; CuA simple; cross veins not numerous. Clavus closed (CuP and Pcu + A<sub>1</sub> not running to its cuspidal apex, but running along wing margin) (Figs 7, 8). First anal vein (A<sub>1</sub>) become the marginal vein. This vein is interrupted



**Figs 1–6.** Issidae and Caliscelidae. 1–3. *Thabena frontocolorata* sp. n., holotype, female: 1 = dorsal view, 2 = frontal view, 3 = ovipositor, ventral view. 4 = *Redarator bimaculatus* Distant, 1916 (Issidae), male, frontal view. 5 = *Chlamydopteryx mammoides* Gnezdilov et Fletcher, 2010 (Issidae), holotype, female, frontal view. 6 = *Lasonia kirkaldyi* Melichar, 1903 (Caliscelidae), female, frontal view. Total length of *T. frontocolorata* sp. n. is 5.6 mm. Width of metope: *R. bimaculatus*: 1 mm; *Ch. mammoides*: 1.3 mm; *L. kirkaldyi*: 1.5 mm

before the cuspidal apex of clavus (Fig. 8). Hind wings bilobed, with deep cleft between remigium and vannus; costal margin of the wings distinctly concave. Hind tibiae with two lateral spines distally. Apices of tibiae with 7 spines. First metatarsomere a bit longer than second metatarsomere, with two latero-apical spines and 12 intermediate spines arranged in two rows (6 + 6). Arolium of pretarsus not exceeding the length of claws (in dorsal view).

Colouration – Metope red brownish with light yellow spots (traces of larval sensory pits between lateral margins and traces of sublateral carinae) (Fig. 2). Transverse carina of metope, traces of sublateral carinae, and band above the metopoclypeal suture light yellow. Metope between traces of sublateral carinae red with pair of large glossy black spots below the transverse carina and with light yellow large elongate horizontal spot below the black spots. Genae light yellow with large red spot above the scapus. Scapus, pedicel, and anteclypeus dark brown. Postclypeus brown yellowish. Coryphe light red anteriorly, light yellow brownish posteriorly, with light yellow margins (Fig. 1). Pronotum light brown yellowish with light yellow tubercles – traces of larval sensory pits. Mesonotum light yellow brownish with pair of light brown spots laterally. Paranotal lobes of pronotum with black margins and light yellow transverse stripes. Epimera of mesonotum black below the wings, light yellow medially and dark brown basally. Fore wings light brown with dark brown patches, veins light brown or reddish. Cuspidal apex of clavus white. Hind wings brown. Abdomi-



**Figs 7–8.** *Thabena frontocolorata* sp. n., holotype, female: 7 = fore wing, 8 = forewing, apex of clavus. Abbreviations: cp – cuspidal apex of clavus; cs – claval suture; Pcu – postcubital vein; A<sub>1</sub> – first anal vein; A<sub>2</sub> – second anal vein. Total length of *T. frontocolorata* sp. n. is 5.6 mm

nal tergites brown reddish. Abdominal sternites light yellow brownish. Femora and tibiae yellow brownish with dark brown spots and longitudinal red stripes particularly on tibiae. Apices of 3rd tarsomeres and claws dark brown. Apices of spines black. Gonoplags dark brown yellowish with light yellow margins (Fig. 3). Anal tube light yellow.

Female genitalia – Hind margin of sternum VII with large median process (Fig. 3). The process wide with convex lateral margins, concave apically. Anal tube at least 3 times as wide as long. Anal column short. Gonoplags without carinae.

Total length – 5.6 mm.

## DISCUSSION

The metope with glossy spots described above for *T. frontocolorata* sp. n. is also the character of the south Indian genus *Redarator* Distant, 1916 (Fig. 4) from the tribe Issini. However, *Redarator* differs from *Thabena* by absence of transverse carina on metope, presence of well visible sublateral carinae, slightly narrowing apically fore wings with 2-branched CuA, hind wings 3-lobed, hind margin of female sternum VII without large median process, and anal tube of male and female long and narrow. Apparently, such structure of metope of these two genera is a kind of mimicry of the large frontal eyes of salticid spiders as was expected for another Issini species, the Australian *Chlamydopteryx mammooides* Gnezdilov et Fletcher, 2010 (Fig. 5) (GNEZDILOV & FLETCHER 2010) and for an Eurybrachyidae species, the Australian *Gelastopsis insignis* Kirkaldy, 1906 (CONSTANT 2005). Another condition of the “metopial eye” but apparently with the same function is a character of *Lasonia kirkaldyi* Melichar, 1903 (Fig. 6) – endemic Sri Lankan Caliscelidae.

According to the venation of fore wings with 2-branched radius (ScP+RA, RP) and median (MP1, MP2) and simple cubitus anterior (CuA) and the presence of clavus with peculiar cuspidal caudo-dorsal angle (cuspidal apex) (Fig. 8), well developed bilobed hind wings with deep cleft between remigium and vannus and rudimentary anal lobe, and large median process of hind margin of female sternum VII (Fig. 3) the genus *Thabena* is closely related to the genus *Pseudochoutagus* Che, Zhang et Wang, 2011 (CHE *et al.* 2011; GNEZDILOV & CONSTANT 2012). The last genus is known from Northern Vietnam and Hainan I. (China) with two species.

Apparently, *Thabena* as well as *Pseudochoutagus* may be treated as close to the ancestor of the tribe Parahiraciini Cheng et Yang or even as the members of this tribe according to the structure of hind wings mentioned above which is one of the apomorphies of the tribe (GNEZDILOV & WILSON 2007). This point of view is confirmed also by the molecular data where *Thabena* is placed in one cluster with “typical” Parahiraciini (SUN *et al.* 2015). For final solution of this question a thorough phylogenetic analysis of the family Issidae is necessary.



\*

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