

# The identity of the backswimmer *Nychia limpida* Stål, 1860, recently collected in Hunan Province, China (Hemiptera: Heteroptera: Notonectidae)

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## Abstract

The genus *Nychia* Stål, 1860 (Notonectidae) is studied. *Nychia limpida* Stål, 1860 is redescribed on the basis of the recently collected material from China. *Nychia sappho* Kirkaldy, 1901 is also studied and illustrated. China is the only country known in which more than one species of *Nychia* occur.

**Key words:** Heteroptera, Notonectidae, *Nychia limpida*, China.

## Resumen

**La identidad del notonectido *Nychia limpida* Stål, 1860, recientemente capturado en la Provincia de Hunan, China (Hemiptera: Heteroptera: Notonectidae)**

Se estudia el género *Nychia* Stål, 1860 (Notonectidae). Se describe *Nychia limpida* Stål, 1860 con base en el material recientemente recolectado en China. También se estudia e ilustra *Nychia sappho* Kirkaldy, 1901. China es el único país conocido en el que viven más de una especie de *Nychia*.

**Palabras clave:** Heteroptera, Notonectidae, *Nychia limpida*, China.

## Laburpena

***Nychia limpida* Stål, 1860 notonektidoaren identitatea, Txinako Hunan Lurraldean berriki harra-patua (Hemiptera: Heteroptera: Notonectidae)**

*Nychia* Stål, 1860 generoa (Notonectidae) aztertzen da. *Nychia limpida* Stål, 1860 berdeskribatzen da, Txinan berriki bildutako materialean oinarrituta. *Nychia sappho* Kirkaldy, 1901 ere aztertu eta irudiztatzen da. Txina da, dakigunez, *Nychia* espezie bat baino gehiago bizi direneko herrialde bakarra.

**Gako-hitzak:** Heteroptera, Notonectidae, *Nychia limpida*, Txina.

## Introduction

The species of the backswimmer genus *Nychia* are small (body length 4–6 mm) water bugs with whitish colour dorsally, and mostly brachypterous. The genus can be recognized, within the Old World fauna, by the inner margins of eyes in dorsal view converging and meeting each other in posterior third (Figs. 1a,c, 2c-d), combined with its small size. Although two species

were included in the catalogue of the Heteroptera of the Palaearctic Region (Polhemus, 1995), and apart from the single record from Corsica (see below), this genus so far has only been found in the African and Oriental Regions. Their usual habitat is nearly stagnant stretches of streams or, in the dry season, potholes in the streambed. They were also collected from ponds including fish ponds. The genus *Nychia* so far holds three valid species: *N. limpida* Stål, 1860, *N. sappho* Kir-

kaldy, 1901, and *N. marshalli* (Scott, 1872); in addition, one species is of uncertain status: *N. infuscata* Paiva, 1918 (Chen *et al.*, 2005).

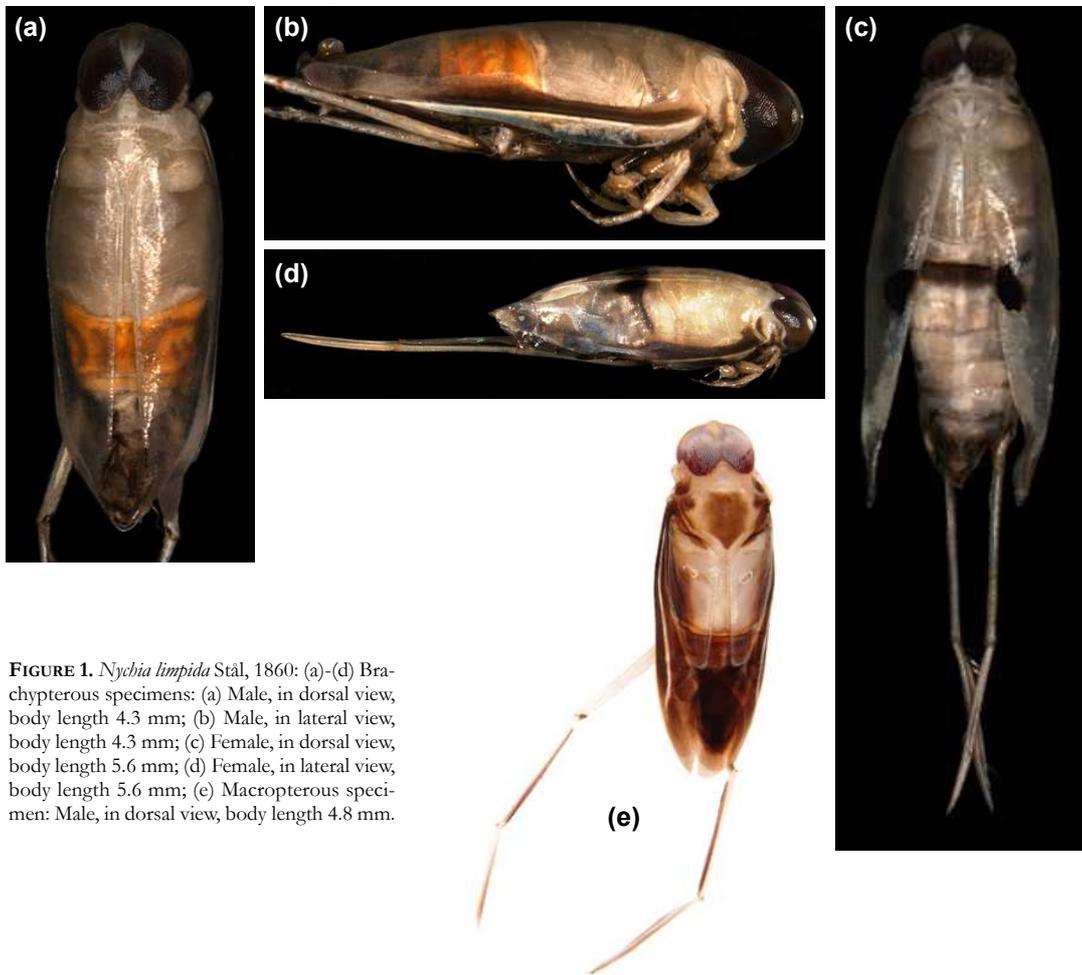
The genus *Nychia* was established by Stål (1860) to include *N. limpida* from Wampoa, Guangdong, China, which was described on the basis of a single specimen of unknown sex. The next species to be described was, under the generic name *Antipalocoris*, *N. marshalli* (Scott, 1872). T.A. Marshall, who collected the species in Corsica, reported that it was in 1870 abundant in the river Gravone (Marshall, 1872). Since then, *N. marshalli* has never been collected again in Corsica. However, according to literature records it is widespread, and to be considered as the only species of *Nychia* occurring in Africa (Hutchinson, 1929; Lansbury, 1985). Kirkaldy (1901) studied a series of *Nychia* from New Guinea including the first macropterous specimen. He gave his series the name *N. marshalli* var. *sappho*, which refers to the form with a black spot in the middle of the hemelytra when folded over the abdomen in brachypterous females. However, this colour variation turns out to occur in all known species of *Nychia*. Paiva (1918) described *N. infuscata* from Inlé Lake, Burma (= Myanmar), but its specific status remains uncertain (see discussion below). Hale (1925) described further two macropterous specimens of *Nychia* from Australia as *N. marshalli* var. *atavia*, apparently overlooking the publication by Kirkaldy (1901), who already discussed the macropterous form of his *N. marshalli* var. *sappho* from South New Guinea. Hutchinson (1929) discussed variability in colour of *Nychia*, and considered the various described taxa belonging to one species, namely *N. limpida* with various subspecies. He also gave the first figures to illustrate the male genitalia of a *Nychia* species, under the name *N. limpida limpida*, but they are actually *N. marshalli* (Hutchinson, 1929: pl. 33: figs. 1-4). Lundblad (1933) studied the types of *N. marshalli*. He dissected the single male specimen and illustrated its parameres and front leg, and designated it as lectotype. He verified that the southern African species studied by Hutchinson (1929) was the same species as *N. marshalli* from Corsica, and described a new species *N. malayana* from Sumatra and Java with line illustrations of the male genitalia and other structural details. Lundblad's figures are excellent and still very useful for the determination of *N. sappho*. The important work was done by Lansbury in 1985. He revised the genus *Nychia*, and studied the type of *N. limpida* which now consists only of head, thorax, a middle and a hind leg, and some remnants of the hemelytra. He concluded that «The loss of front legs and abdomen precludes any realistic com-

parison with species described subsequently. It is therefore impractical to propose *N. limpida* as a prior name for species described post 1859.» As he provides a figure of the head and pronotum with a scale, there was no need to borrow the remnants of the holotype of *N. limpida* for our present study. Lansbury (1985) also studied specimens of *N. malayana* from Malaysia, the type of *N. marshalli* var. *atavia* and extensive material from northern Australia. He considered that they all belong to the same species: *Nychia sappho* Kirkaldy, 1901, of which he has given an extensive and well illustrated redescription. Subsequently, this species has been reported from the Indonesian island of Sulawesi (Nieser and Chen, 1991), throughout Thailand (Nieser *et al.*, 2008) and the extreme SW of China (Nieser *et al.*, 2005). Some specimens from NW Thailand, which is quite close to Inlé Lake in Burma (Myanmar) show the same colour pattern as described by Paiva (1918) for his *N. infuscata*, so that this might also be a synonym of *N. sappho* (Nieser *et al.*, 2008). Liu and Zheng (1991) listed *Nychia limpida* in a checklist of Chinese Notonectidae, and cited its distribution as: «Guangdong; Sri Lanka, Africa and Europe». They stated that their list is based on material in the collections of Insect Collections of Nankai University, Institute of Zoology, Chinese Academy of Sciences, The Tianjin Museum of Natural History, and recently collected material by the authors. There is no list of references in that paper. However, their data for *N. limpida* seem to be based on the species concept of Hutchinson (1929), and apparently ignored the results of Lundblad (1933) and Lansbury (1985).

Recently a series of *Nychia* was collected in Hunan Province, China. It turns out to be a different species from *N. sappho*. The measurements of the body width given by Stål (1860) and width of head and pronotum given by Lansbury (1985) for *N. limpida* agree well with our specimens from Hunan. In addition, Hunan Province borders Guangdong Province. Therefore, we consider that it is *N. limpida*. As this species is structurally unknown due to the deficient type specimen, we present a redescription with illustrations for it.

## Material and methods

The redescription of *N. limpida* (96% alc.) and diagnosis of *N. sappho* (70% alc.) are based on specimens



**FIGURE 1.** *Nychia limpida* Stål, 1860: (a)-(d) Brachypterous specimens: (a) Male, in dorsal view, body length 4.3 mm; (b) Male, in lateral view, body length 4.3 mm; (c) Female, in dorsal view, body length 5.6 mm; (d) Female, in lateral view, body length 5.6 mm; (e) Macropterous specimen: Male, in dorsal view, body length 4.8 mm.

stored in alcohol. Measurements are presented in mm and as the range of 5 specimens, if available, with the mean in italics, or as the mean value. Body length is measured from the apex of the head to the caudal tip of the hemelytra. The length of the claw of the fore and middle leg refer to the longest claw. The hemelytra are described when closed over the body. All specimens studied in this publication are in the collection of N. Nieser and P.-p. Chen, Tiel, The Netherlands. Habitus photos were taken by Nikon D700, lens AF Micro Nikkor 60 mm, 1:2.8 D, and Leica 500, and further polished with Adobe Photoshop CS2, version 9.0.

## Systematic part

### *Nychia limpida* Stål, 1860

(Figs. 1, 3a-c)

- Nychia limpida* Stål, 1860: 268-269; pl. 3: fig. 8.  
 Nec *Nychia limpida*; Hutchinson, 1929: 409-415.  
*Nychia limpida*; Lundblad, 1933: 150.  
*Nychia limpida*; Lansbury 1985: 1-2.  
*Nychia limpida*; Liu and Zheng 1991: 44 (only the record from Guangdong).  
*Nychia limpida*; Polhemus 1995: 73.  
*Nychia limpida*; Chen *et al.*, 2005: 164, 542.

**Material studied:**

CHINA: Hunan Prov., Wuyunjie Natural Reserve Area, Xixi power plant, fish pond, 2.VIII.2010, leg. P.-p. Chen, CN1016, 11 ♂♂ 28 ♀♀ brachypterous, 2 ♂♂ 1 ♀ macropterous.

**Redescription:**

BRACHYPTEROUS SPECIMENS (Figs. 1a-d):

*Dimensions.* Length, male 4.28–4.33–4.41, female 5.56–5.61–5.71; width, male 1.38–1.42–1.50, female 1.60–1.63–1.68. *Colour.* Generally a pale, whitish species. Dorsally, eyes usually dark grey to dark brown, reddish in some specimens, interoculus sordid white with a pair of sublateral longitudinal brownish stripes. Pronotum whitish, foveae of pronotum in some specimens, notably females, ventro-laterally infuscated. Hemelytra largely translucent, embolium, costal margin and membrane (Figs. 1b,d) with a broad opaque band, variably infuscated, in most specimens nearly entirely dark grey but in some specimens medium brownish in proximal half only. In addition, a short narrow whitish opaque stripe along inner margin just in front of the membrane. Females with a variable dark brown to blackish spot along inner margin above the base of abdomen (Fig. 1c). This spot varies from absent to one sixth the length and about half the width of the hemelytron in dorsal view. Mesosoma and metanotum white, well visible through the hemelytra. Abdominal dorsum yellowish to medium brown, apically darker. Ventrally, frons whitish, rostrum whitish with a blackish stripe over the front and distal segment black. Mesosternum dark brown to blackish, metasternum whitish, coxal plates blackish. Abdominal venter sordid white to brownish. Legs sordid white with apex of fore and middle tarsi, and base and apex of hind femur dark brown to blackish.

*Structural characteristics.* Inner margins of eyes meeting posteriorly (Figs. 1a,c,e), lateral margins (in lateral view) sinuate (Fig. 1b). Vertex produced in front of the eyes dorsally, and depressed between the eyes above the labrum. Pronotum transverse, its median length 0.4 times its humeral width (0.5/1.2), width of a fovea 0.2 times the width of pronotum (0.25/1.2). Scutellum small, its basal width slightly larger than its median length (♂ 0.70/0.65, ♀ 0.78/0.71). Hemelytra without sutures (Figs. 1b,d), membranes reduced to oval lobes lying laterally of the apex of the abdomen. Chaetotaxy of the legs as usual in the genus *Nychia*, the difference between males and females is discussed below. Length of leg segments: anterior leg: male femur 0.64, tibia 0.60, tarsI 0.29, tarsII 0.14, claw 0.14,

female femur 0.66, tibia 0.65, tars 0.43, claw 0.32; intermediate leg: male femur 0.68, tibia 0.61, tarsI 0.27, tarsII 0.14, claw 0.36, female femur 0.76, tibia 0.69, tars 0.45, claw 0.38; posterior leg: male femur 1.86, tibia 1.70, tarsI 1.12, tarsII 0.56, female femur 2.28, tibia 2.09, tarsI 1.30, tarsII 0.63.

*Male.* Anterior tarsi two-segmented, each segment distally with a comb of whitish, poorly contrasted bristles. Intermediate tarsi two segmented. *Female.* Anterior tarsi one-segmented, distally with a small comb of whitish bristles, along median edge with a thick fringe of short (about half as long as the width of the tarsus) bristles and two longer (length 1.5 times the width of tarsus) bristles. Intermediate tarsi one-segmented.

*Genitalia.* Right paramere (Fig. 3a): apex not hooked; in dorsal view (Fig. 3b) only weakly curved. Left paramere (Fig. 3c) in lateral view with a blunt apex.

MACROPTEROUS SPECIMENS (Fig. 1e):

*Dimensions.* Length, male 4.62–4.72–4.83, female 5.30; width, male 1.44–1.48–1.51, female 1.65. *Colour.* Pronotal foveae infuscated in ventral half. Scutellum with a central brown spot. Corium and membrane velvety dark brown to blackish. Otherwise as in brachypterous form.

*Structural characteristics.* Scutellum large, its basal width slightly larger than its median length (♂ 1.14/1.03, ♀ 1.29/1.12). Hemelytra clearly divided in clavus, corium and membrane, membranes well developed, folded over the apex of abdomen. Otherwise as brachypterous form.

***Nychia sappho* Kirkaldy, 1901**

(Figs. 2, 3d-g)

*Nychia marshalli* var. *sappho* Kirkaldy, 1901: 809-810.

*Nychia marshalli* var. *atavia* Hale, 1925: 17-19.

*Nychia malayana* Lundblad, 1933: 148-155.

*Nychia sappho*; Lansbury 1985: 4-8, figs.

*Nychia sappho*; Nieser and Chen, 1991: 64.

*Nychia sappho*; Nieser et al., 2005: 207.

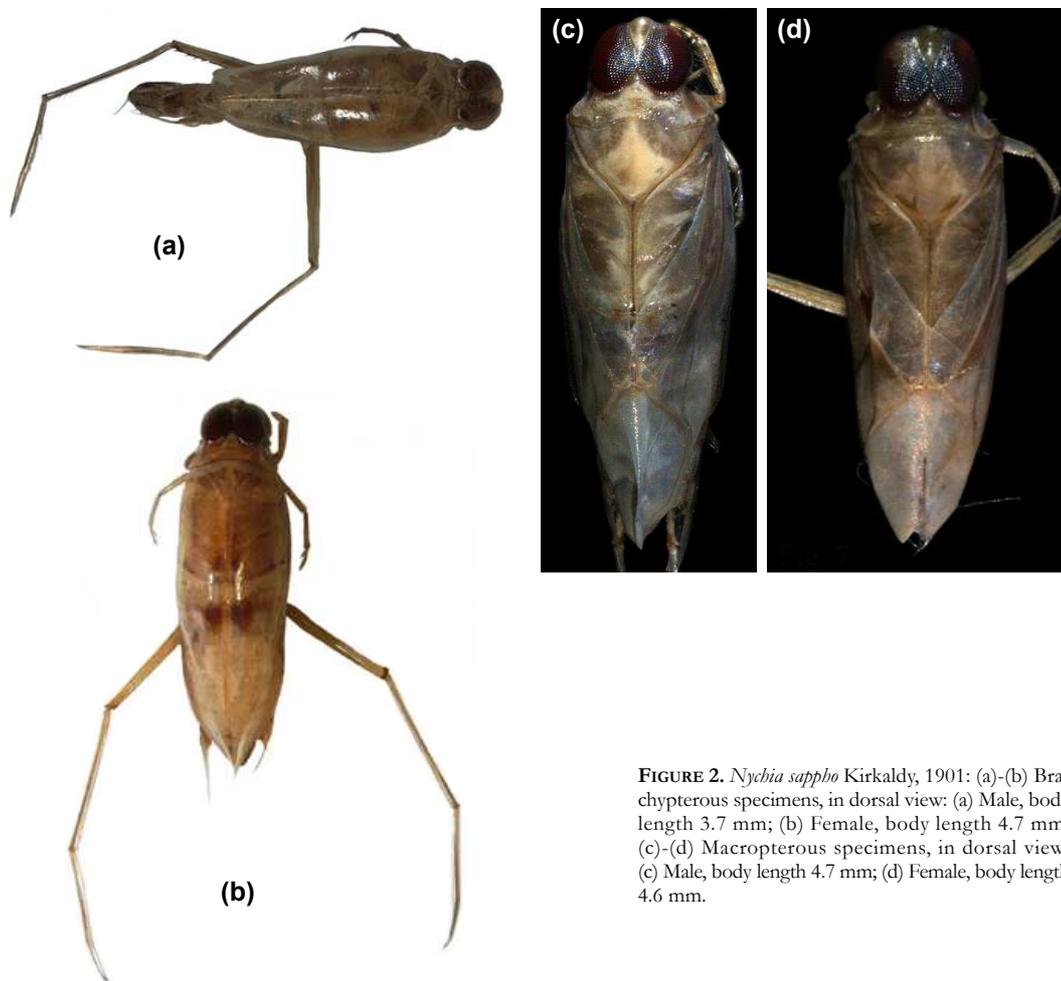
*Nychia sappho*; Chen et al., 2005: 164-165, 423, 542, figs. 165, 166.

*Nychia sappho*; Nieser et al., 2008: 285-288.

**Material studied:**

MALAYSIA: Selangor, Sungai Klang at Klang Gate, 19.VI.1961, leg. K. Lim, 7 ♂♂ 8 ♀♀ brachypterous.

THAILAND: Nakhon Ratchasima Prov., Phimai Distr., Sai Ngam N.P., 50 km NE of Nakhon Ratchasima City, pond, 26.XII.1994, leg. P.-p. Chen



**FIGURE 2.** *Nyctibia sappho* Kirkaldy, 1901: (a)-(b) Brachypterous specimens, in dorsal view: (a) Male, body length 3.7 mm; (b) Female, body length 4.7 mm; (c)-(d) Macropterous specimens, in dorsal view: (c) Male, body length 4.7 mm; (d) Female, body length 4.6 mm.

9 ♂♂ 1 ♀ macropterous, 3 ♂♂ brachypterous; Satun Prov. Thaleh Ban N.P., small lake in front of office, 26.XI.1995, leg. N. Nieser, N9530, 7 ♂♂ 12 ♀♀ brachypterous.

INDONESIA: Sulawesi, Tenggara Prov., Wawong-gole, Sungai Anggoro, 20.II.1989, leg. N. Nieser, N8901, 2 ♂♂ 4 ♀♀ brachypterous.

#### Diagnosis:

BRACHYPTEROUS SPECIMENS (Figs. 2a-b):

*Dimensions.* Length male 3.66–3.71–3.78, female 4.69–4.76–4.83; width male 1.06–1.13–1.18, female 1.25–1.35–1.41. *Colour.* Most specimens are entirely sordid white with eyes usually reddish. Hemelytra

translucent, costal margin and membrane with a broad opaque band, in some specimens light brownish infuscated. Some females with a dark brown to blackish spot along inner margin above the base of abdomen. *Structural characteristics.* Scutellum small, its basal width somewhat larger than its median length (♂ 0.66/0.56, ♀ 0.78/0.69). Hemelytra without sutures, membranes reduced to oval lobes lying laterally of the apex of the abdomen. *Male.* Right paramere (Figs. 3d-f) with a hooked apex and strongly curved inward in dorsal view (Fig. 3e). Left paramere apically somewhat narrowed (Fig. 3g).

MACROPTEROUS SPECIMENS (Figs. 2c-d):

*Dimensions.* Length male 3.95–4.06–4.11, female

4.55; width male 1.17–1.20–1.22, female 1.33. *Colour*. From entirely sordid white to corium and membrane light brown. Scutellum unicolorous (Fig. 2c), large, its basal width somewhat larger than its median length ( $\sigma$  1.05/0.82,  $\text{♀}$  1.08/0.95). Otherwise as brachypterous form.

Lansbury (1985) gives an extensive and well illustrated redescription of this species. However, most of the characteristics mentioned in this redescription are shared by other species of the genus *Nychia*.

## Discussion

Stål (1860) gave the body length for his *N. limpida* as 2.75 mm. But he stated already in his description that the abdomen was distorted. Lundblad (1933), who studied the specimen about 70 years later, stated (translated from the German): «as one can see from the figure by Stål the specimen is defect, notably a large part of the abdomen and the posterior half of the hemelytra are missing». The width of the body as given by Stål (1860) and the width of head and pronotum as given by Lansbury (1985) are applicable to both *N. limpida* and *N. sappho*. So the length of *N. limpida* as given by Stål (1860) is erroneous.

A study of the male parameres (Fig. 3) shows that the specimens collected in Hunan belong to a species different from *N. sappho*. The type of *N. limpida* was collected in China: «Wampo», spelled nowadays as «Whampo» in Google Maps which is the area called Huangpu in Guangzhou, the capital city of Guangdong Province. As Hunan Province borders Guangdong Province, we are confident that our specimens belong to *N. limpida* Stål, 1860. As *N. sappho* has been found in SW China (Nieser *et al.*, 2005), so far China is the only country known in which more than one species of *Nychia* occur.

### Comparative notes:

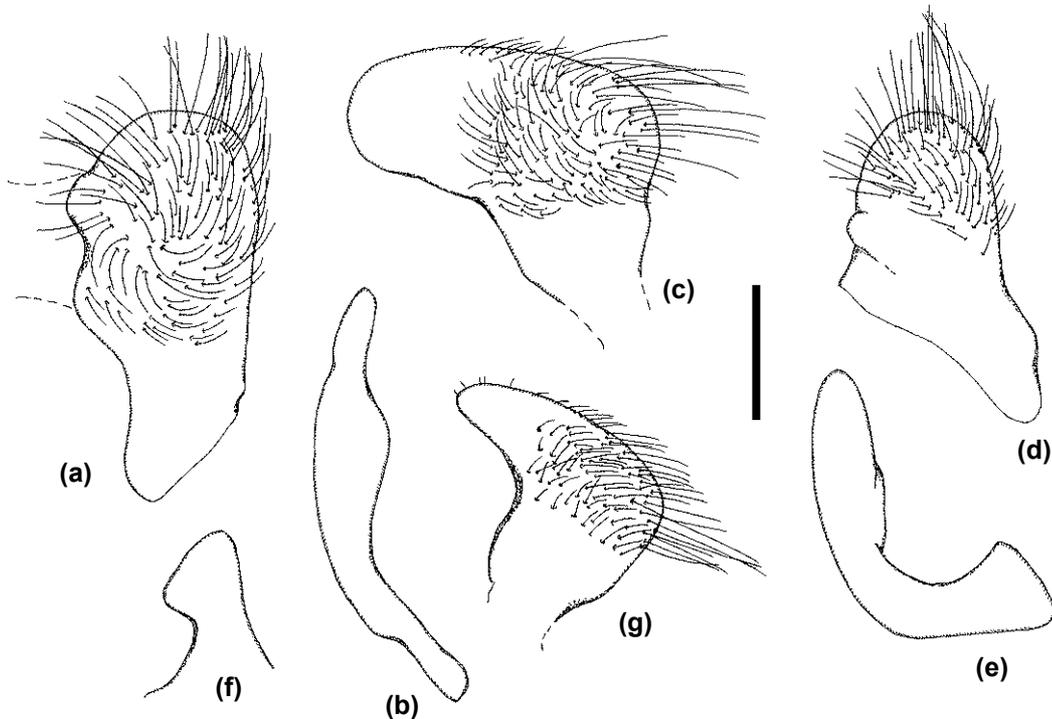
Apart from its larger size and darker coloration, *N. limpida* differs from *N. sappho* mainly by the structure of the parameres (Fig. 3). The right paramere of *N. sappho* (Figs. 3d-e) is strongly curved inward and its apex is hooked (Fig. 3f), whereas the right paramere of *N. limpida* (Figs. 3a-b) is weakly curved inward and not hooked at its apex. The left paramere of *N. sappho* (Fig. 3g), in lateral view, is distinctly narrower in its apical part than that of *N. limpida* (Fig. 3c).

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**FIGURE 3.** Male genitalia of *Nychia*. (a)-(c) *Nychia limpida* Stål, 1860: (a) Right paramere, in lateral view; (b) Right paramere, in dorsal view; (c) Left paramere, in lateral view; (d)-(g) *Nychia sappho* Kirkaldy, 1901: (d) Right paramere, in lateral view; (e) Right paramere, in dorsal view; (f) Apex of right paramere, in anterolateral view; (g) Left paramere, in lateral view (Scale bar = 0.1 mm).

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