

The brown lacewings from Vietnam (Neuroptera Hemerobiidae)

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Five species of Hemerobiidae (Neuroptera) are recorded from Vietnam. Genus *Semohemerobius* Yang 1983 (= *Mesohemerobius* Nakahara 1966) is considered as a new synonym of the genus *Hemerobius* Linnaeus 1758. *Notiobiella nguyenii* is described as a new species; *Hemerobius subacutus* (Nakahara 1966), *Hemerobius barmandinus* Navás 1910 and *Psectra iniqua* (Hagen 1859) are diagnosed.

KEY WORDS: Neuroptera, Hemerobiidae, Vietnam, taxonomy, faunistics.

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INTRODUCTION

The Oriental Hemerobiidae are relatively poorly known. No species of this family has hitherto been recorded from Vietnam. Five species noted below were collected in the Northern Provinces of Vietnam by Nguyen Xuan Thanh and by Dr Sergey Belokobylskij. Of these, *Micromus timidus* Hagen 1853 was abundant in agricultural fields on *Hibiscus sabdariffa* (Linnaeus 1753) where its larvae were recorded as predators of aphids.

All the material including the holotype of the new species *Notiobiella nguyenii* n. sp. is deposited in Institute of Biology and Pedology, Vladivostok.

ABBREVIATIONS

A1-A3, first to third anal veins; *anc*, antecosta; *b*, basal crossvein between *M* and *Rs* («basal piece of *MA*»); *ctp*, catoprocessus; *CuA*, *CuP*, anterior and posterior cubital veins; *ltp*, lateroprocessus; *M*, median vein; *r*, intraradial crossvein; *R*, *Rs*, radial vein and its sector; *Sc*, subcostal vein; *8T, 9T*, 8th and 9th tergites.

SYSTEMATICS

***Micromus timidus* Hagen 1853 (Figs 1-4)**

Remarks. References, comprehensive description and drawings of the genitalia were given by TJEDER (1961) and by NEW (1988a). I give only the drawings of wing venation of a Vietnamese specimen and mouth parts. Morphology of mouth parts (especially their chaetotaxy) has some taxonomic value but it has not yet been studied in detail. It is only known now that each genus has quite different chaetotaxy and may be distinguished by this character. However there is very little information about the differentiation of these structures at species level.

Material examined. Prov. Hai Hu'ng, 1989, on *Hibiscus sabdariffa*, 7 ♂♂, 3 ♀♀, and 3 specimens without abdomen (Nguyen Xuan Thanh); Prov. Ha Son Binh, Ky Són, 25-29.X.1990, 1 ♀ (Nguyen Xuan Thanh); Mai Châu, 10.XI.1990, 1 ♂, 1 ♀ (Nguyen Xuan Thanh); Da Bao Tuly, 16.X.1990, 1 ♀ (Nguyen Xuan Thanh); 22.X.1990, 1 ♀ (Belokobylskij); Hanoi, 8.V.1975, 1 ♀ (L. Medvedev).

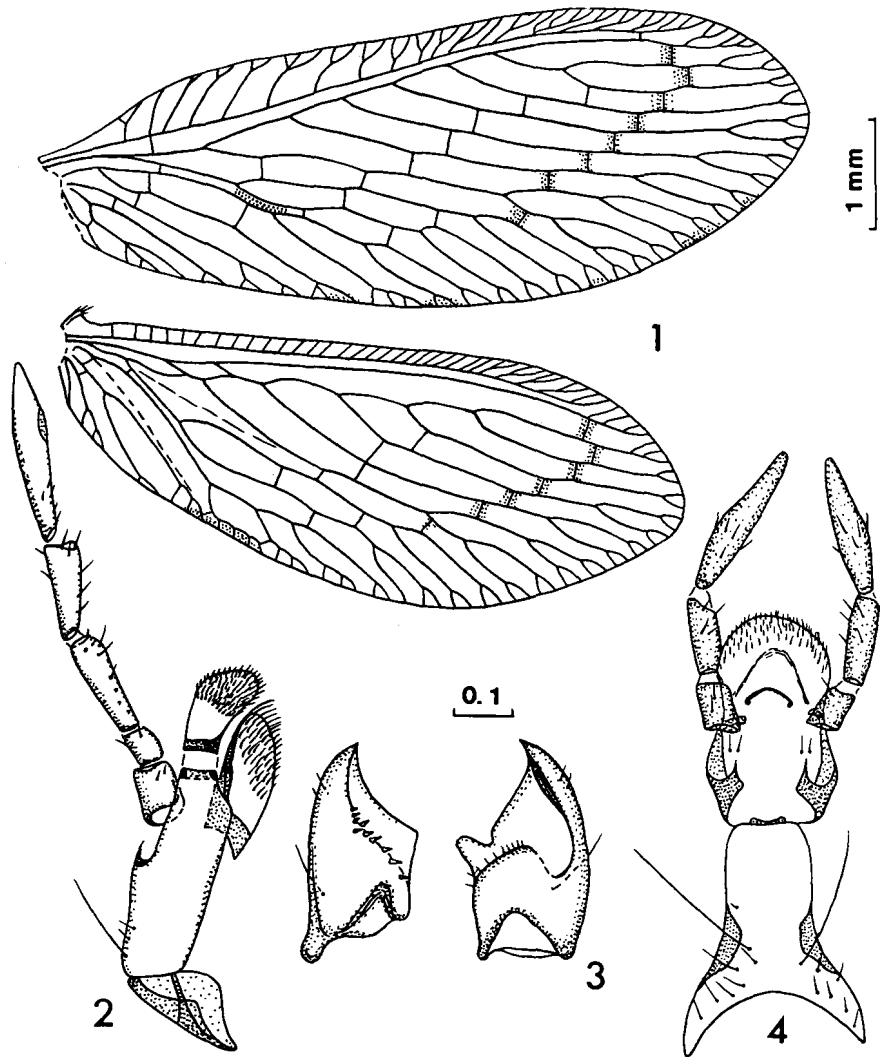
Distribution. Africa (Côte-d'Ivoire, Equatorial Guinea, Guinea [recorded for the first time!], Mozambique, Nigeria, Senegal, Tanzania, Republic of South Africa), Madagascar, the Seychelles, India, Sri Lanka, Thailand, Vietnam, Malaysia, the Philippines, South China, Taiwan, Java, Krakatau, Sumatra, Bali, Buru, Ryukyus, Volkano Is., Bonin Is., New Guinea, Australia, New Caledonia, New Hebrides, Fiji, Samoa, Mariana Is., Caroline Is.

***Notiobiella nguyeni* n. sp. (Figs 5-12)**

Description. Head brown; genae dark brown; postocular lobes blackish; vertex dark brown with whitish spot in central part. Antennae pale yellowish-brown. Palpi dark-brown. Pronotum dark-brown except for lateral lobes and the longitudinal median stripe which are whitish. Prescutum of mesothorax almost entirely dark-brown, yellow along the middle suture. Mesoscutum, mesoscutellum and metanotum mostly light yellow, laterally dark-brown. All tibiae swollen, fusiform, covered with very short and dense hairs. Hind tibiae posteriorly with a median dark-brown narrow band.

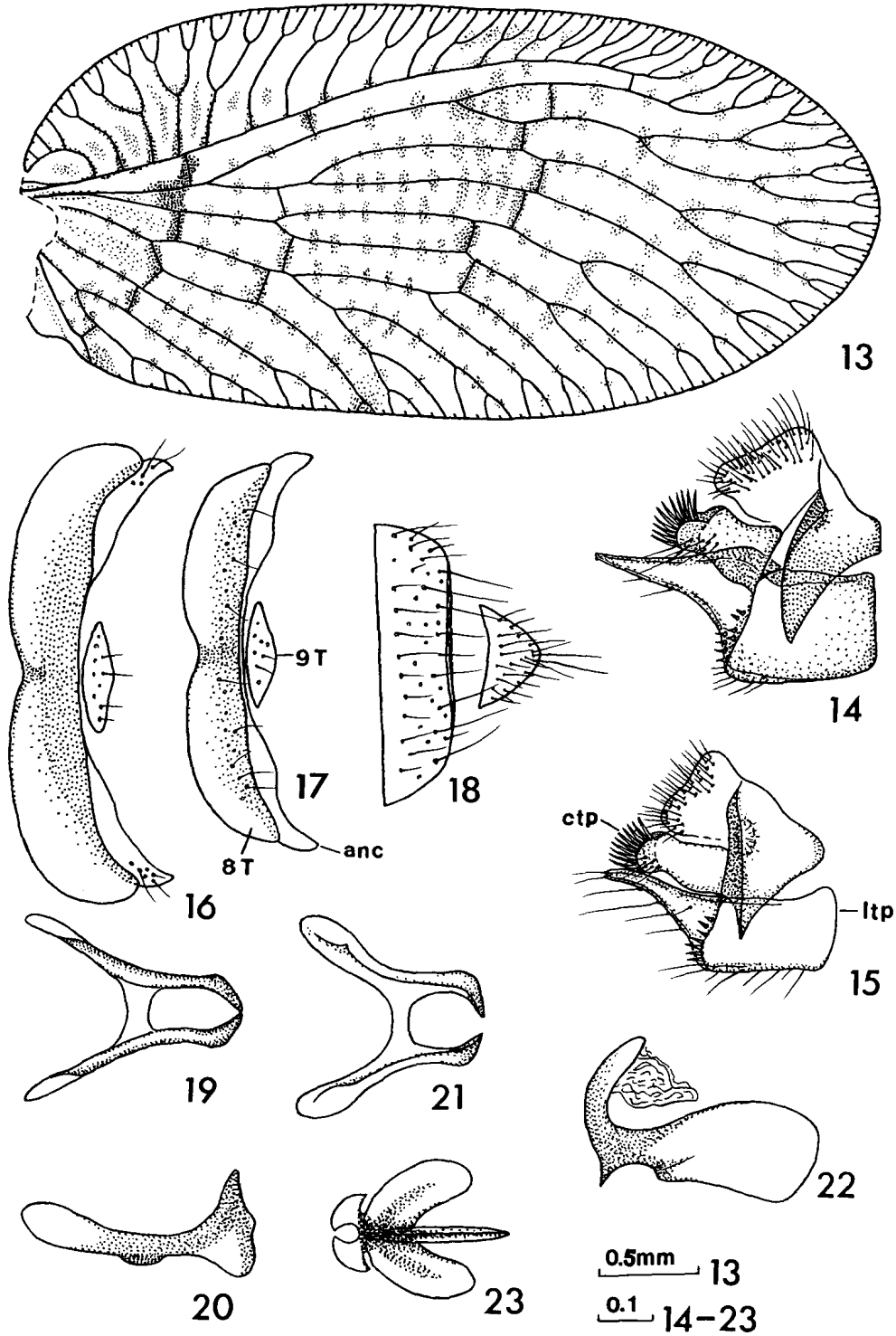
Forewings (Fig. 5): length 5.7 mm, maximum width 2.6 mm. Broadly oval, with a rounded apex. Base of the wing blackish. Membrane hyaline, pale greenish-yellow with three brownish spots: on *Rs*, on branches of *CuA* and at apex of *CuP*. Longitudinal veins green or brownish-green. Costal veinlets mainly brownish. Crossveins dark-brown margined heavily with dark-brown. Branchings usually tinged with brownish.

Hindwings: length 3.9 mm, maximum width 1.7 mm. Membrane pale tinged with greenish. Venation green or brownish green. Pterostigma pale, slightly greenish.



Figs 1-4. — *Micromus timidus*, female. Fig. 1, wings. Fig. 2, right maxilla, ventral. Fig. 3, mandibles, ventral. Fig. 4, labium, ventral. (Figs 2-4 to same scale).

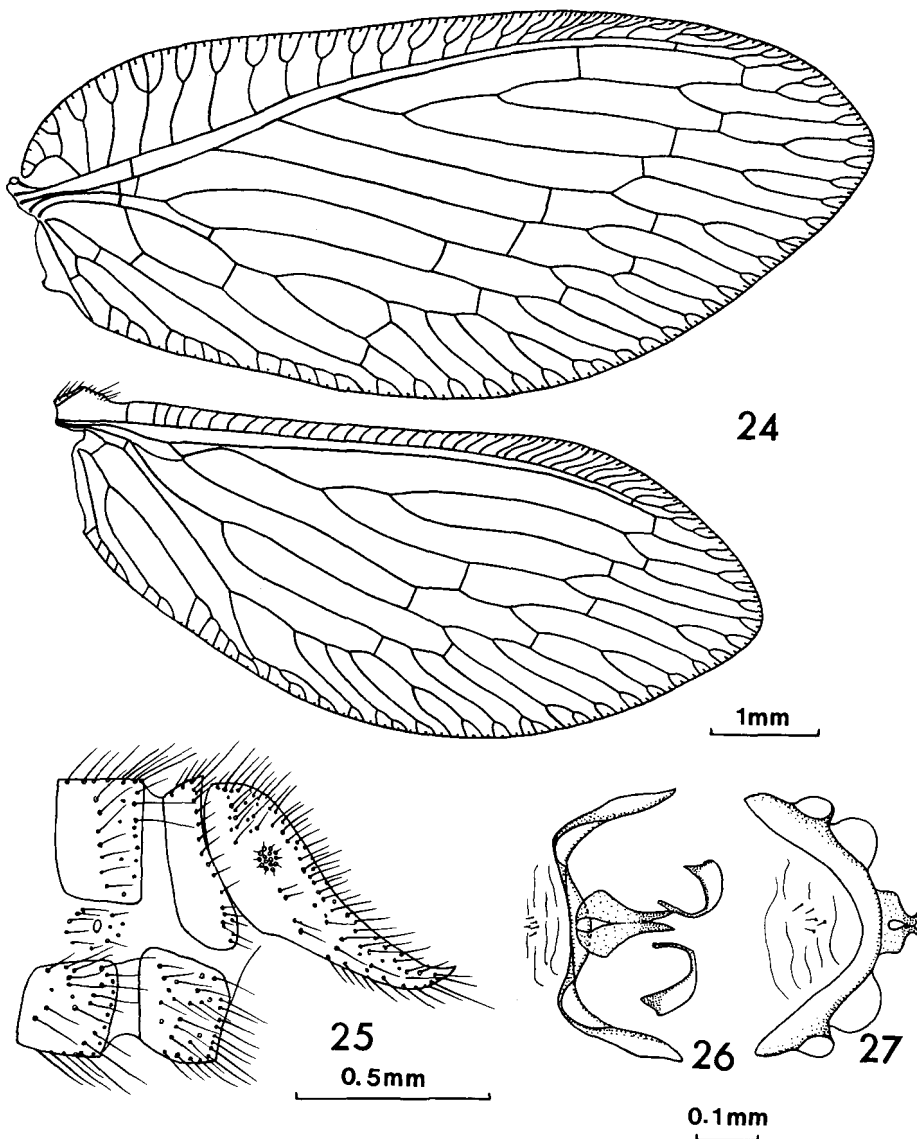
Male genitalia (Figs 6-12): 9th tergite with rounded anteroventral projection; medially with an elongated sclerotized plate. Ectoproct with three long processes; the dorsal one with more or less acute apex, the other two with expanded apices. Anterodorsal edge of ectoproct excavated. Callus cerci with about 20 trichobothria. Middle processus both relatively short and stout and with long, fine setae. Gonarcus and associated structures are shown in Figs 8-11. Parameres fused, with a long slender stem and two oval lobes.



Figs 13-23. — *Psectra iniqua*, male (Sri Lanka: Figs 13-14, 16, 19-20, 22-23; Vietnam: Figs 15, 17-18, 21). Fig. 13, forewing. Figs 14-15, left ectoproct, inside. Figs 16-17, 8th and 9th tergites. Fig. 18, 8th and 9th sternites. Figs 19 and 21, gonarcus, dorsal. Fig. 20, same, lateral. Fig. 22, parameres, lateral. Fig. 23, same, caudal.

Diagnosis. Forewing (Fig. 24): venation is characterized by the following peculiarities: costal area in basal part broad; costal veinlets mostly with only one branch; area between recurrent vein and subcostal vein very broad; inner gradate series of crossveins very short, with only three crossveins in all the specimens examined; between R and M two short basal crossveins; crossvein between hind branch of M and CuA very short.

Male genitalia (Figs 25-27): ectoproct with an acute apex. Lateral wings of



Figs 24-27. — *Hemerobius subacutus*, male. Fig. 24, wing-venation. Fig. 25, apex of abdomen, lateral. Fig. 26, gonarcus and parameres, caudal. Fig. 27, gonarcus, dorsal. (Figs 26-27 to same scale).

gonarcus with two pairs of projecting lobes. Parts of arcessus fused apically, but separated basally. Membrane between lateral wings of gonarcus with five short fine setae. I propose for this structure the name *area setosa*; it occurs in all the species of the genus *Hemerobius* Linnaeus 1758 studied by me and in some species of the genus *Wesmaelius* Krüger 1922 and *Symphorobius* Banks 1904.

Female genitalia (Figs 28-29): 9th tergite with strong tooth-like processus at its anterior-ventral edge directed inwards. Such a processus is absent in all other species of the genus for which the female genitalia are described. Subgenital plate distinct.

Remarks. The genus *Semohemerobius* Yang (= *Mesohemerobius* Nakahara) established for this species is in my opinion a synonym of the genus *Hemerobius* (syn. n.). The former differs from the latter only by the arcessus fused apically and by 9th tergite of female with a ventral process. I think that these characters are too vague to have generic value.

Hemerobius subacutus is very similar in both wing venation and male genitalia to *Hemerobius kutsimensis* (NEW 1988b) described recently from New Guinea. These two species form a distinct natural group which should be considered probably as a subgenus within the *Hemerobius*.

On the other hand, *H. subacutus* is apparently identical with *Hemerobius exoticus* described by NAVÁS (1936) from China. Unfortunately, the type of this species is now lost. Specimens from South Primorye of Russia previously considered by me as belonging to this species, represent a different species which will be described elsewhere.

Material examined. Vietnam: Prov. Ha Son Binh, Mai Chau, 10.XI.1990, 1 ♀ (Nguyen Xuan Thanh); Prov. Son Binh, Da Bac, Tuly, 16.X.1990, 1 ♀ (Nguyen Xuan Thanh); ibidem, 22.X.1990 (S. Belokobylskij), 1 ♂; Prov. Vinh Phu, Tam Dao, 12.XI.1990, 1 ♀ (Nguyen Xuan Thanh).

Distribution. Ryukyus, Taiwan, Vietnam.

***Hemerobius harmandinus* Navás 1910 (Figs 30-35)**

Hemerobius harmandinus NAVÁS 1910b: 395 (original description) [type: «Japon, Nippon moyen, env. de Tokio, J. Harmand, 1906»; «Mus. de Paris»]; NAVÁS 1916: 233 (discussion); NAKAHARA 1919: 136 (listed); KUWAYAMA 1956: 25 (faunistics); NAKAHARA 1960: 46, fig. 100 (description of male genitalia); NAKAHARA 1966: 202 (faunistics); MONSERRAT 1991: 67 (faunistics).

Hemerobius nakaharinus NAVÁS 1916: 235 (nomen novum for *Hemerobius nitidulus* sensu NAKAHARA 1915a) [type: female, Japan, «Gifu, Mr S. Yamamura coll.».]. Synonymised by NAKAHARA 1919.

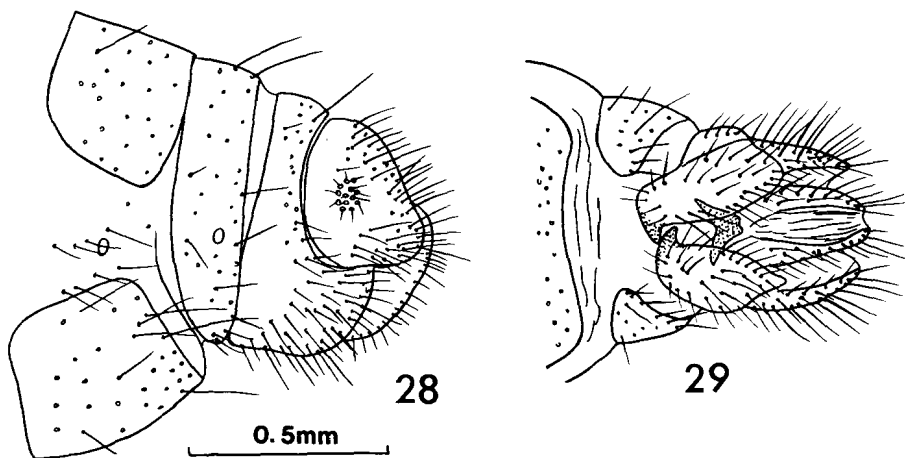
Hemerobius nitidulus (nec Fabricius 1777); NAKAHARA 1915a: 32 (description); NAKAHARA 1915b: 100 (listed); YASUMATSU 1937: 144 (faunistics). Synonymised by NAKAHARA 1919.

Diagnosis. Externally the species closely resembles the Palearctic species *Hemerobius nitidulus* Fabricius 1777 but differs from it in the forewings with a longitudinal paler area before CuA.

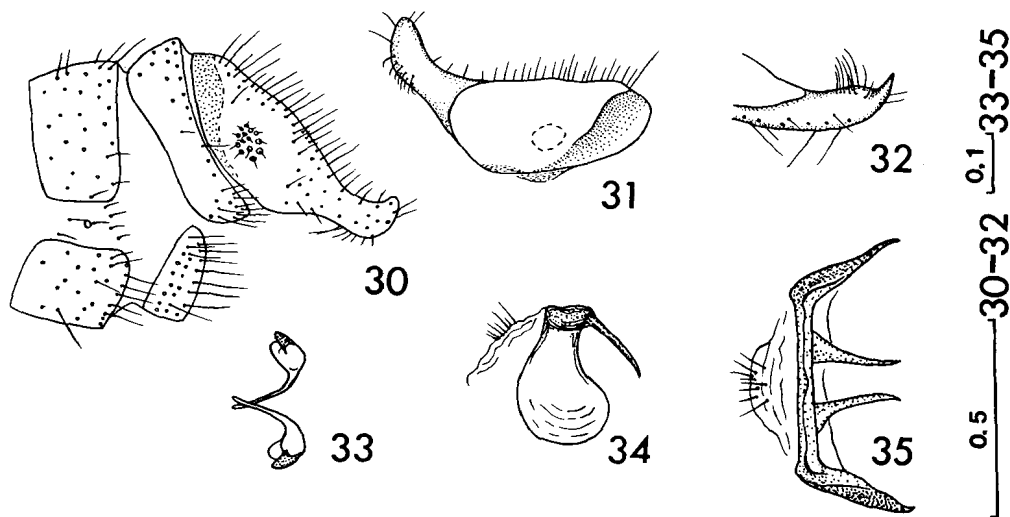
Male genitalia (Figs 30-35): ectoproct without anoproct. Catoproct with an apical tooth (Fig. 32). Gonarcus with parts of arcessus widely spaced. Area setosa with about nine setae. Parameres with apical tooth.

Material examined. Vietnam: Prov. Vinh Phu, Tam Dao, 12.XI.1990 (Nguyen Xuan Thanh), 1 ♂; ibidem, 1000 m, 16.XI.1990 (S. Belokobylskij), 1 ♂. China: East Szechwan, 24.XI.1954, at light (G. Bey-Bienko), 1 ♂.

Distribution. Japan, China, Vietnam, India.



Figs 28-29. — *Hemerobius subacutus*, female. Fig. 28, apex of abdomen, lateral. Fig. 29, same, ventral. (Both figures to same scale).



Figs 30-35. — *Hemerobius harmandinus*, male. Fig. 30, apex of abdomen, lateral. Fig. 31, left ectoproct, inside. Fig. 32, apex of ectoproct, lateral. Fig. 33, parameres, dorsal. Fig. 34, gonarcus, lateral. Fig. 35, same, caudal. (Both scales in millimeters).

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REFERENCES

- BANKS N. 1913. Synopses and descriptions of exotic Neuroptera. *Transactions of the American Entomological Society* 39: 201-242.
- BANKS N. 1932. Concerning the genus *Notiobiella* (Neuropt. - Hemerobiidae). *Psyche* 39: 103-106.
- BANKS N. 1937. Neuropteroid insects from Formosa. *Philippine Journal of Science* 62 (3): 255-291.
- ESBEN-PETERSEN P. 1913. H. Sauter's Formosa-Ausbeute. Planipennia II, Megaloptera and Mecoptera. *Entomologische Mitteilungen* 2 (7-8): 222-228.
- ESBEN-PETERSEN P. 1928. New and little-known Neuroptera from the Dutch East Indies. *Treubia* 10 (2-3): 225-230.
- GHOSH S.K. & SEN S. 1977. Check-list of Indian Planipennia (order Neuroptera). *Records of the Zoological Survey of India* 73 (1-4): 277-326.
- HAGEN H. 1859. Synopsis der Neuroptera Ceylons (part II). *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien* 9: 199-212.
- HAGEN H. 1866. Hemerobidarum synopsis synonymica. *Stettiner Entomologische Zeitung* 27: 369-462.
- KUWAYAMA S. 1956. An annotated list of the Neuroptera-Planipennia from Shikoku, Japan. *Transactions of the Shikoku Entomological Society* 5: 19-32.
- KUWAYAMA S. 1964. On the Neuroptera of the Ryukyus. *Insecta Matsumurana* 27 (1): 38-48.
- MONSERRAT V.J. 1991. Nuevos datos sobre algunas especies del genero *Hemerobius* L., 1758 (Insecta, Neuroptera: Hemerobiidae). *Graellsia* 47: 61-70.
- NAKAHARA W. 1915a. On the Hemerobiidae of Japan. *Annotationes Zoologicae Japonenses* 9: 11-48.
- NAKAHARA W. 1915b. On the family Hemerobiidae. *Konchu Sekai [The Insect World]* 19 (7): 271-273 (in Japanese).
- NAKAHARA W. 1919. A revised list of the Japanese Hemerobiidae (Neuroptera). *Konchu Sekai [The Insect World]* 23: 135-137.
- NAKAHARA W. 1960. Systematic studies on the Hemerobiidae (Neuroptera). *Mushi* 34 (1): 1-69.
- NAKAHARA W. 1966. Hemerobiidae, Sisyridae and Osmyliidae of Formosa and Ryukyu Islands (Neuroptera). *Kontyu* 34 (3): 193-207.
- NAVÁS L. 1910a. Hemerobidos (Ins. Neur.) nuevos. Con la clave de las tribus y generos de la familia. *Broteria (Serie Zoologica)* 9: 69-90.
- NAVÁS L. 1910b. Hemerobides nouveaux du Japon (Neuroptera). *Russkoe Entomologicheskoe Obozrenie [Revue Russe d'Entomologie]* 9: 395-398.
- NAVÁS L. 1916. Neuropteros nuevos o poco conocidos (sexta serie). *Memorias de la Real Academia de Ciencias y Artes de Barcelona* 12 (7): 119-136.
- NAVÁS L. 1930. Insecta orientalia. VIII series. *Memorie della Pontificia Accademia delle Scienze. I Nuovi Lincei* (2) 14: 419-434.
- NAVÁS L. 1936. Néuroptères et insectes voisins Chine et pays environnants (Neuvième Série). *Notes d'Entomologie Chinoise* 3 (4): 37-62.
- NEEDHAM J.G. 1909. Notes on the Neuroptera in the collection of the Indian Museum. *Records of the Indian Museum* 3 (3): 185-210.
- NEW T.R. 1988a. A revision of the Australian Hemerobiidae (Insecta: Neuroptera). *Invertebrate Taxonomy* 2 (3): 339-411.
- NEW T.R. 1988b. Hemerobiidae (Insecta: Neuroptera) from New Guinea. *Invertebrate Taxonomy* 2 (5): 605-632.
- TJEDER B. 1961. Neuroptera-Planipennia. The lacewings of Southern Africa. 4. Family Hemerobiidae. *South African Animal Life* 8: 296-408.
- YANG CHI-KUN 1978. Neuroptera, pp. 248-269, pls 46-49. In: Institute of Zoology, Academy of Sciences of China. Atlas of insects. Vol. 3. Atlas of entomophagous insects. *Peking: Science Press* (in Chinese).
- YANG CHI-KUN 1981. The brown lace-wings of Mt. Wuyishan (Neuroptera: Hemerobiidae). *Wuyi Science Journal* 1: 191-196 (in Chinese).
- YANG CHI-KUN 1983. *Semohemerobius* nom. nov. for *Mesohemerobius* Nakahara 1966 (nec Ping 1928). *Entomotaxonomia* 5 (2): 128 (in Chinese).
- YASUMATSU K. 1937. Two species of Hemerobiidae unrecorded from Kyushu. *Mushi* 9: 144 (in Japanese).

REFERENCES

- BANKS N. 1913. Synopses and descriptions of exotic Neuroptera. *Transactions of the American Entomological Society* 39: 201-242.
- BANKS N. 1932. Concerning the genus *Notiobiella* (Neuropt. - Hemerobiidae). *Psyche* 39: 103-106.
- BANKS N. 1937. Neuropteroid insects from Formosa. *Philippine Journal of Science* 62 (3): 255-291.
- ESBEN-PETERSEN P. 1913. H. Sauter's Formosa-Ausbeute. Planipennia II, Megaloptera and Mecoptera. *Entomologische Mitteilungen* 2 (7-8): 222-228.
- ESBEN-PETERSEN P. 1928. New and little-known Neuroptera from the Dutch East Indies. *Treubia* 10 (2-3): 225-230.
- GHOSH S.K. & SEN S. 1977. Check-list of Indian Planipennia (order Neuroptera). *Records of the Zoological Survey of India* 73 (1-4): 277-326.
- HAGEN H. 1859. Synopsis der Neuroptera Ceylons (part II). *Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien* 9: 199-212.
- HAGEN H. 1866. Hemerobidarum synopsis synonymica. *Stettiner Entomologische Zeitung* 27: 369-462.
- KUWAYAMA S. 1956. An annotated list of the Neuroptera-Planipennia from Shikoku, Japan. *Transactions of the Shikoku Entomological Society* 5: 19-32.
- KUWAYAMA S. 1964. On the Neuroptera of the Ryukyus. *Insecta Matsumurana* 27 (1): 38-48.
- MONSERRAT V.J. 1991. Nuevos datos sobre algunas especies del genero *Hemerobius* L., 1758 (Insecta, Neuroptera: Hemerobiidae). *Graellsia* 47: 61-70.
- NAKAHARA W. 1915a. On the Hemeribiidae of Japan. *Annotationes Zoologicae Japonenses* 9: 11-48.
- NAKAHARA W. 1915b. On the family Hemerobiidae. *Konchu Sekai [The Insect World]* 19 (7): 271-273 (in Japanese).
- NAKAHARA W. 1919. A revised list of the Japanese Hemerobiidae (Neuroptera). *Konchu Sekai [The Insect World]* 23: 135-137.
- NAKAHARA W. 1960. Systematic studies on the Hemerobiidae (Neuroptera). *Mushi* 34 (1): 1-69.
- NAKAHARA W. 1966. Hemerobiidae, Sisyridae and Osmylidae of Formosa and Ryukyu Islands (Neuroptera). *Kontyu* 34 (3): 193-207.
- NAVÁS L. 1910a. Hemerobidos (Ins. Neur.) nuevos. Con la clave de las tribus y generos de la familia. *Broteria (Serie Zoologica)* 9: 69-90.
- NAVÁS L. 1910b. Hemerobides nouveaux du Japon (Neuroptera). *Russkoe Entomologicheskoe Obozrenie [Revue Russe d'Entomologie]* 9: 395-398.
- NAVÁS L. 1916. Neuropteros nuevos o poco conocidos (sexta serie). *Memorias de la Real Academia de Ciencias y Artes de Barcelona* 12 (7): 119-136.
- NAVÁS L. 1930. Insecta orientalia. VIII series. *Memorie della Pontificia Accademia delle Scienze. I Nuovi Lincei* (2) 14: 419-434.
- NAVÁS L. 1936. Néuroptères et insectes voisins Chine et pays environnants (Neuvième Série). *Notes d'Entomologie Chinoise* 3 (4): 37-62.
- NEEDHAM J.G. 1909. Notes on the Neuroptera in the collection of the Indian Museum. *Records of the Indian Museum* 3 (3): 185-210.
- NEW T.R. 1988a. A revision of the Australian Hemerobiidae (Insecta: Neuroptera). *Invertebrate Taxonomy* 2 (3): 339-411.
- NEW T.R. 1988b. Hemerobiidae (Insecta: Neuroptera) from New Guinea. *Invertebrate Taxonomy* 2 (5): 605-632.
- TJEDER B. 1961. Neuroptera-Planipennia. The lacewings of Southern Africa. 4. Family Hemerobiidae. *South African Animal Life* 8: 296-408.
- YANG CHI-KUN 1978. Neuroptera, pp. 248-269, pls 46-49. In: Institute of Zoology, Academy of Sciences of China. Atlas of insects. Vol. 3. Atlas of entomophagous insects. *Peking: Science Press* (in Chinese).
- YANG CHI-KUN 1981. The brown lace-wings of Mt. Wuyishan (Neuroptera: Hemerobiidae). *Wuyi Science Journal* 1: 191-196 (in Chinese).
- YANG CHI-KUN 1983. *Semohemerobius* nom. nov. for *Mesohemerobius* Nakahara 1966 (nec Ping 1928). *Entomotaxonomia* 5 (2): 128 (in Chinese).
- YASUMATSU K. 1937. Two species of Hemerobiidae unrecorded from Kyushu. *Mushi* 9: 144 (in Japanese).