

## Asian dobsonflies (Megaloptera: Corydalidae) of the collection of Zoological Institute of Russian Academy of Science, Saint Petersburg

### Азиатские коридалы (Megaloptera: Corydalidae) коллекции зоологического института РАН, Санкт-Петербург

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КЛЮЧЕВЫЕ СЛОВА. Corydalinae, Chauliodinae, коридалы, Азия, новые находки.

**ABSTRACT.** The annotated list of 32 species of dobsonflies of subfamilies Corydalinae and Chauliodinae of Eastern Palearctic and Oriental Region from collection of Zoological Institute of Russian Academy of Science is given. Three species, *Neoneuromus ignobilis* Navás, 1932, *Protohermes yunnanensis* Yang et Yang, 1988 and *Neochauliodes punctatolus* Liu et Yang, 2006, which were earlier known from southern China and northern Vietnam, are recorded in the southern Vietnam for the first time. Moreover, the female of *Nevromus testaceus* Rambur, 1842 earlier known as the Javanese and Sumatran endemic was caught in March 1995 by A.V. Gorokhov in Vietnam. This record is associated with the random drift of the specimen by the tsunami which was occurred in 1995 in Indonesia. Another specimen of *Protohermes* sp. from northern Vietnam is the new species and will be describe by Dr. Liu in the separate publication.

**РЕЗЮМЕ.** В работе приводится аннотированный список 32 вида коридалов подсемейств Corydalinae и Chauliodinae фауны Восточной Палеарктики и Ориентального царства из коллекции Зоологического института РАН. Три вида, ранее известные из южного Китая и северного Вьетнама, *Neoneuromus ignobilis* Navás, 1932, *Protohermes yunnanensis* Yang et Yang, 1988 и *Neochauliodes punctatolus* Liu et Yang, 2006, теперь, по материалам коллекции зарегистрированы из южного Вьетнама. Кроме того, одна самка *Nevromus testaceus* Rambur, 1842, до сих пор известная как эндемик Суматры и Явы, была поймана А.В. Гороховым в марте 1995 г. во Вьетнаме. Эта поимка связывается с заносом этого экземпляра цунами, документально произошедшим в 1995 г. в Индонезии. Ещё один коллекционный экземпляр из рода *Protohermes* из Северного Вьетнама оказался новым видом, подготовленным к описанию д-ром Лью, и войдет в типовую серию.

### Preface

The holometabolan order Megaloptera belongs to the superorder Neuropterida and comprises only two extant families, i.e. Corydalidae and Sialidae, currently with ca. 380 species in the world [Yang, Liu, 2010; Liu et al., 2015]. The larvae of Megaloptera are exclusively aquatic. However, the megalopteran adults, especially those of Corydalidae, are diagnostic insects, some of which are remarkably large-sized with enlarged mandibles, and they can be usually collected by light trap near the aquatic habitats. The collection of Megaloptera in the Institute (recently Zoological Museum) originated from the specimens, purchased from insect trader Staudinger and rather than from own Russian zoologists. More productive collectors of dobsonflies in Asian countries were A.V. Abramov, V.M. Gnezdilov, A.V. Gorokhov, S.A. Ryabov, V.A. Trjapitzyn, N.N. Vinokurov, A.K. Zagulyaev.

V.L. Bianchi, O.M. Martynova, S.G. Lepneva, L.A. Zhiltzova were curators of the collection in different periods. Victor Krivokhatsky — is the last curator, and Julia Samartseva — is a keeper of collection.

About 6 genera from the New World and 2 genera from Australia are presented in the Institute collection, but not type material. One Russian species of Corydalidae, Megaloptera, was in interest of T.S. Vshivkova. She later got types as a loan after first description [Vshivkova, 1995] but has not yet returned the loaned material. Some photos from these specimens were published in her last publication [Vshivkova, Dubatolov, 2010].

The present list contains 32 Asian species of Corydalidae including both subfamilies Corydalinae and Chauliodinae, which are considerably diverse with more than 150 species in the Asian part of Palearctic and Oriental region. Most specimens of all species listed here belong to the known areas of distribution reported in Yang, Liu

[2010], Liu et al. [2006, 2009, 2012] and Letardi et al. [2012]. However, three species, i.e. *Neoneuromus ignobilis* Navás, 1932, *Protohermes yunnanensis* Yang et Yang, 1988 and *Neochauliodes punctatolus* Liu et Yang, 2006, which were known in southern China and northern Indochina, are first recorded in southern Vietnam. In addition, a single female of *Nevromus testaceus* Rambur, 1842, which was known previously as endemic to Sumatra and Java, was collected in Vietnam by A.V. Gorokhov in March of 1995. That capture could be connected with specimen transfer with tsunami, occur in 1995 in Indonesia. Next one specimen of *Protohermes* from Northern Vietnam is an unpublished new species.

### Systematic part

Corydalidae  
Corydalinae

#### *Acanthacorydalis orientalis* (McLachlan, 1899)

MATERIAL. 1♀, China, Sichuan, 60 km NW of Chengdu, Matsaonin vil., the experimental station, 31.269161°N, 103.323669°E, summer 1954, anonym coll.

#### *Acanthacorydalis fruhstorferi* van der Weele, 1907

MATERIAL. 1♀, Northern Vietnam, Lao Cai Prov., 6 km W of Sa Pa, north slope of Phansipan Mt. area, near Tram Ton (station of Hoang Lien National Park), 22°21' N, 103°46' E, h = 1930 m, May 2008, A.V. Abramov coll.

#### *Neoneuromus ignobilis* Navás, 1932

MATERIAL. 2♂, China, Yunnan, Tszindun [Xinping Yi and Dai Autonomous County], 26–28.05.1956, A.K. Zagulyaev coll.;

1♂, Vietnam, Son La Prov., Son La env., Na Ng'u; at light, 10.05.1986, V.A. Trjapitzyn coll.; 1♂, Amci Thau, *Neuromus fenestralis* [McL., ♂, coll. Staudinger]; 1♀, Vietnam, Lam Dong Prov., Bidoup-Nui Ba Nat. Park, 5 km NE Long Lanh Vill., Giang Ly, h 1444 m, N12°10.960' E108°40.792', at light, 23–27.V.2014, V.M. Gnezdilov coll.

DISTRIBUTIONAL NOTES. New record for southern Vietnam (Figs 1–2).

#### *Neoneuromus maclachlani* (van der Weele, 1907)

MATERIAL. 1♂, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 12.06.1994, A. Baranov coll.; 1♂, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 3.07.1994, A. Monastyrskiy coll.; 2♂, 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17.05.1995, A.V. Gorokhov coll.; 1♀, N. Vietnam, Tam Dao, 9.06.1997, S.A. Ryabov coll.; 1♂, Omei Shan [China; Sichuan Prov.], *Chauliodes sinensis* Walk., anonym coll. and det.

#### *Neoneuromus orientalis* Liu et Yang, 2004

MATERIAL. 2♀, Vietnam, no other locality.

#### *Neoneuromus tonkinensis* (van der Weele, 1907)

MATERIAL. 2♂, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17–31.05.1995, A.V. Gorokhov coll.; 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17.05.1995, A.V. Gorokhov coll.

#### *Neurhermes maculipennis* (Gray, 1832)

MATERIAL. 2♂, 2♀, Ases, Chirique *Neuromus ruficollis* Gerst., coll. Staudinger.

#### *Nevromus exterior* (Navás, 1927)

MATERIAL. 2♀, Vietnam, Son La Prov., Son La vill., 3.05.1986, A. V. Gorokhov coll.; 1♀, Vietnam, Son La Prov., Son La env., Na Ng'u, at light, 12.05.1986, V.A. Trjapitzyn coll.; 8♀, Vietnam, Gia Lai Prov., 20 km N of Kannak v., Buon Loi, 22–31.03.1995, A.V. Gorokhov coll.



Figs 1–2. *Neoneuromus ignobilis*, ♂: 1 — habitus; 2 — label.

Рис. 1–2. *Neoneuromus ignobilis*, ♂: 1 — внешний вид; 2 — этикетка.

*Nevromus testaceus* Rambur, 1842

MATERIAL. 1♀, Vietnam, Gia Lai Prov., 20 km N of Kannak v., Buon Loi, 22–31.03.1995, A.V. Gorokhov coll.

DISTRIBUTIONAL NOTES. This species was known as endemic to Sumatra and Java. So, that is the first record for Vietnam. The specimen has broken costal area of forewing (Figs 3–4), which could be aftermath of the typhoon, usually having in the region meridional direction, from Indonesia to Vietnam.

*Protohermes albipennis* (Walker, 1853)

MATERIAL. 1♀, Nepal, 32 km E Kathmandu, Nagarkot, hotel, 21.05.2012, at light, A. Bezborodkin coll.

*Protohermes axillatus* Navas, 1932

MATERIAL. 2♀, Northern Vietnam, Lao Cai Prov., 6 km W of Sa Pa, north slope of Phansipan Mt. area, near Tram Ton (station of Hoang Lien National Park), 22°21' N, 103°46' E, h = 1930 m, May 2008, A.V. Abramov coll. (Figs 5–6).

*Protohermes davidi* van der Weele, 1909

MATERIAL. 1♂, China, C Sichuan, Dayi distr., Chadiping env., 1200–1500 m, 5–7.08.1996, A.I. Miroshnikov & A. Zamotajlov coll.; 1♀, China, Sichuan, Lunan'fu, Hodzigou, 6000 ft, 07–08.93, Berezov coll.

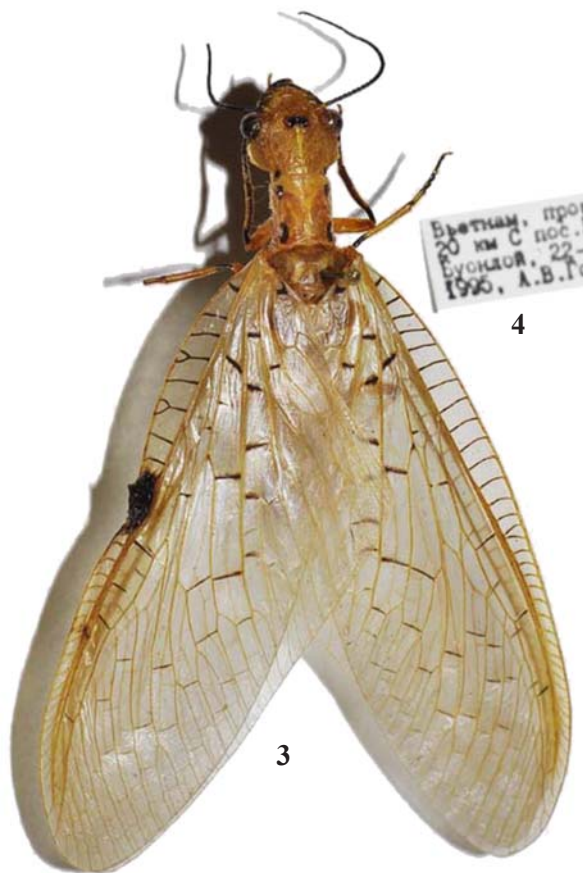
*Protohermes differentialis* (Yang et Yang, 1986)

MATERIAL. 2♂, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 1000 m, 9–11.04.1996, A. Gorokhov coll.; 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., 12.06.1994, A. Baranov coll.

*Protohermes grandis* (Thunberg, 1781)

(catalog): 1 sp. — № 776, coll. Staudinger.

MATERIAL. 1♂, *Neurimus grandis* Thunb.; Japan. Kot-ljarevskiy coll.; 1♀, *Neurimus grandis* Thb.; Japan, № 776, coll. Staudinger.; 1♀, Japan, Kyushu, Obama; 8.VIII.1907; Cherskyi coll.; 1♀, Hokkaido otoineppi; 30–31.VII.1997; N.N. Vinokurov coll.



Figs 3–4. *Nevromus testaceus*, ♀: 5 — habitus; 6 — label.

Рис. 3–4. *Nevromus testaceus*, ♀: 5 — внешний вид; 6 — этикетка.



Figs 5–6. *Protohermes axillatus*, ♀: 5 — habitus; 6 — label.

Рис 5–6. *Protohermes axillatus*, ♀: 5 — внешний вид; 6 — этикетка.

Northern Vietnam, Lao Cai Province, 6 km west of Sa Pa, north slope of Phansipan Mt. area, near Tram Ton (station of Hoang Lien National Park)  
22°21' N, 103°46' E, H=1930 m  
May 2008, coll. Abramov A.V.  
(Expedition of Russia-Vietnam Tropical Centre)



*Protohermes guangxiensis* Yang et Yang, 1986

MATERIAL. 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., 3.07.994, A. Monastyrskiy coll.; 1♀, N. Vietnam Tam Dao, 14.06.01, S. Ryabov coll.

*Protohermes sinuolatus* Liu, Hayashi et Yang, 2009

MATERIAL. 1♀, Vietnam, Gia Lai Prov., 20 km N of Kannak v., Buon Loi, 22–31.03.1995, A.V. Gorokhov coll.

*Protohermes striatulus* Navás, 1926

MATERIAL. 2♂, 3♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17–31.05.1995, A.V. Gorokhov coll.

*Protohermes xanthodes* Navás, 1913

MATERIAL. 3♀, N. China, Tianjin, 9.VII.1914, Yu. Vasiliev coll.; SYNTYPES *Protohermes martynovae* Vshivkova, 1995 [defined in Vshivkova, Dubatolov, 2010]: 1♂, 1♀, Russia, Jakovlevka Village, Spasskiy Uezd, Ussurisky Region [Primorsky Region], 17.VII.1926, col. A.M. Djakonov, N.N. Filipjev (dry, pinned material replaced in alcohol); 1♂, Kvashuk's Honey Farm at Jakovlevka Village, Spasskiy Uezd, Ussurisky Region, 28.VI.1926, col. A.M. Djakonov, N.N. Filipjev (dry, pinned material) (reported in Vshivkova, Dubatolov, 2010 as deposited in Zoological Institute of RAN, St-Petersburg, but still does not returned after the loan).

SYSTEMATICAL NOTES. *Protohermes matynovae* Vshivkova, 1995 was synonymized with *Protohermes xanthodes* by Liu et al. [2006]. Then *P. martynovae* is treated as the junior synonym of *P. xanthodes* in LDL and sequences publications. There is no doubt they are same species although Vshivkova still prefers to the validity of *P. martynovae*. More over the name *P. martynovae* is nomen nudium because placed in interrupted description: Vshivkova, 1995 — is only key, and Vshivkova, Dubatolov, 2010 — redescription and types designation.

ICZN: 10.1.1. If publication of the data relating to a new nominal taxon or a nomenclatural act is interrupted and continued at a later date, the name or act becomes available only when the requirements of the relevant Articles have been met.

*Protohermes yunnanensis* Yang et Yang, 1988

MATERIAL. 1♀, Vietnam, Lam Dong Prov., Bidoup-Nui Ba Nat. Park, 5 km NE Long Lanh Vill., Giang Ly, h 1444 m, N12°10.960' E108°40.792', at light, 23–27.V.2014, V.M. Gnezdilov coll.

DISTRIBUTIONAL NOTES. New record for southern Vietnam.

*Protohermes* sp.

MATERIAL. 1♂, N. Vietnam, Lao Cai Prov., 6 km W of Sapa, h = 1950 m, 05.2008, A.V. Abramov coll.

NOTES. This is an unpublished new species previously found by Xingyue Liu. This will be a paratype since this new species is described.

## Chauliodinae

*Ctenochauliodes abnormis* Yang et Yang, 1986

MATERIAL. 1♂, 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17–31.05.1995, A.V. Gorokhov coll.; 1♀, Vietnam, Hoa Binh Prov., Mai Chau Distr., Pa Co, 20°44' N, 104°55' E, 1120 m, 22–24.04.2002, S. Belokobylskij coll.

*Ctenochauliodes nigrovenosus* (van der Weele, 1907)

MATERIAL. 1♀, N. Vietnam, Cao Bang Prov., Nguen Binh, h = 800 m, 1–15.05.03, S.A. Ryabov coll.

*Neochauliodes bicuspidatus* Liu et Yang, 2006

MATERIAL. 1♀, N. Vietnam, Lao Cai, 6 km W of Sapa, h = 1950 m, 05.2008, A.V. Abramov coll.

*Neochauliodes formosanus* (Okamoto, 1910)

MATERIAL. 1♂, China, Foochow, May 30 1957, M.S. Yang

*Neochauliodes koreanus* van der Weele, 1909

MATERIAL. 4♂, 4♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17–31.05.1995, A.V. Gorokhov coll.



Fig. 7. *Neochauliodes punctatolus*: ♂, Vietnam, Son La Prov., Son La env., Na Ng'u; at light, 4.05.1986 V.A. Trjapitzyn coll.

Рис. 7. *Neochauliodes punctatolus*: ♂, Вьетнам, провинция Шон Ла, окр. Шон Ла, На Нгу, на свет 4.05.1986 В.А. Тряпицын.

- Neochauliodes meridionalis* van der Weele, 1909  
 MATERIAL. 1♂, Vietnam, Ha Tinh Prov., Son Kim, 1–12.04.2003 S.A. Ryabov coll.
- Neochauliodes moriutii* Asahina, 1987  
 MATERIAL. 1♂, N. Thailand, Lampang prov., Buan Pa Mieng, 1.08.2011, A. Pushenkov coll.
- Neochauliodes punctatolus* Liu et Yang, 2006  
 MATERIAL. 1♂, China, Yunnan, Tszindun [Xinping Yi and Dai Autonomous County]; Dun- Dzja-fui Mt., 21.06.1956, A. Zagulyaev coll.; 1♂, China, Yunnan, Tszindun [Xinping Yi and Dai Autonomous County], 12.06.1956, A. Zagulyaev coll.; 1♂, Vietnam, Son La Prov., Son La env., Na Ng'u; at light, 4.05.1986, V. Trjapitzyn coll.; 1♂, Vietnam, Lam Dong Prov., Bidoup-Nui Ba Nat. Park, 5 km NE Long Lanh Vill., Giang Ly, h 1444 m, N12°10.960' E108°40.792', At light, 23–27.V.2014, V.M. Gnezdilov coll.
- DISTRIBUTIONAL NOTES. New record for southern Vietnam (Fig. 7).
- Neochauliodes tamdaoensis* Liu, Hayashi et Yang, 2010  
 MATERIAL. 1♂, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17–31.05.1995, A. Gorokhov coll.
- Neochauliodes tonkinensis* (van der Weele, 1907)  
 MATERIAL. 1♂, China, Sichuan, Yundian, 132 km H-Way Dali-Kunming, h = 1618 m, 10.06.2002, M. Volkovich coll.; 2♂, China, Yunnan, Tszindun [Xinping Yi and Dai Autonomous County], 1.06.1956, A. Zagulyaev coll.; 1♂, 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900m, 17–31.05.1995, A.V. Gorokhov coll.; 2♀, Vietnam, Lao Cai Prov., Sa Pa Distr., Fan Si Pan Mt., 22°21'N, 103°46'E, 2000 m, 20.04–9.05.1999, N.L. Orlov coll.; 3♂, 1♀, Vietnam, Lao Cai Prov., 6 km W of Sa Pa, h = 1950 m, 05.2008, A.V. Abramov coll.; 1♀, Burma, Carin Cheba, 900–1100 m, VI.1988, L. Fea coll.
- Neochauliodes umbratus* Kimmins, 1954  
 MATERIAL. 1♂, 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 9–11.04.1986, A.V. Gorokhov coll.; 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 08.05.1994, A.V. Gorokhov coll.; 2♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 17.05.1995, A.V. Gorokhov coll.; 2♂, 1♀, N. Vietnam, Tam Dao, Vinh Phuc Prov., h = 800–900 m, 12.06.1994, A. Baranov coll.
- Parachauliodes asahinai* Liu, Hayashi & Yang, 2008  
 MATERIAL. 1 ex. (Sex unknown), Japan, Kotljarevskiy coll.; *Chauliodes japonicus* Mc. Lh. anonym det.
- Parachauliodes continentalis* van der Weele, 1909  
 MATERIAL. 1♂, 1♀, *Chauliodes japonicus* M.L., Japan, coll. Staudinger.

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