

**Two new species and a new subspecies of the genus *Cychrus* Fabricius, 1794, subgenera *Cychropsis* Boileau, 1901 and *Shuocychropsis* Imura, 2002 (Carabidae: Cychrini) from Sichuan province, central China**

Martin HÄCKEL<sup>1)</sup> Rostislav SEHNAL<sup>2)</sup>

<sup>1)</sup> Department of Game Management and Forestry Zoology, Faculty of Forestry and Wood Sciences, Czech University of Life Sciences, Kamýcká 1176, CZ-165 21 Prague 6, Czech Republic  
e-mail: hackel@uvn.cz

<sup>2)</sup> V Zahradkách 962, CZ-273 51 Unhošť, Czech Republic  
e-mail: rsehnal@aol.com

**Taxonomy, new species, Coleoptera, Carabidae, *Cychrus*, *Cychropsis*, *Shuocychropsis*, Sichuan, China**

**Abstract.** *Cychrus* (*Cychropsis*) *gonggoides* sp. nov., *Cychrus* (*Shuocychropsis*) *huangcao* sp. nov. and *Cychrus* (*Cychropsis*) *draconis jidingensis* ssp. nov. are described and compared with related taxa.

## INTRODUCTION

The taxa described in the present paper belong to Tibet-Himalayan and eastern Palearctic species of the tribe Cychrini Laporte de Castelnau, 1834, since the outset of the 20<sup>th</sup> century placed in the separate genus *Cychropsis* Boileau, 1901 (Deuve 1997, Imura 2001, 2002a, b, Häckel 2003, 2011, Cavazzuti 2010). The taxonomic position of these species continues being a subject of intense discussions and a number of modifications including the definition of new subgenera within the genus *Cychropsis*. Recently, one of us (Häckel 2011) listed 41 species of the genus *Cychropsis* placed in three subgenera, and noted that the known results of genetic analyses rather speak in favour of a monogeneric concept of the Palearctic species, i.e. a sole genus *Cychrus* Fabricius, 1794 with more than 180 Palearctic species. Results of DNA analyses led the same author to synonymization of most subgenera of the related genus *Calosoma* Weber, 1901, in accord with the molecular data reducing them to mere two (Häckel 2013). Applied to the morphology and genetics of the closely related genus *Cychrus* (Osada et al. 2002, Su et al. 2004), we find most congruent the concept by Deuve (2013a, b), which respects the monophyletic character of the group and at the same time takes into account internal morphological differences that are in all current works treated as supraspecific (recognition of three subgenera). We therefore place the new taxa in two subgenera of the genus *Cychrus*.

## SYSTEMATICS

### *Cychnus (Cychropsis) gonggoides* sp. nov.

(Plate 1: Figs. 1, 1a, 1b)

**Type material.** Holotype (♂) labelled: "China - Sichuan, VIII - 2012 / North of Shimian / Huangcao Shan, 3500 m"; in collection of R. Sehnal, to be deposited at the National Museum, Praha, Czech Republic.

**Description.** Medium-sized *Cychnus (Cychropsis)* species exerting a habitus typical of the *C. draconis* species group. Length including mandibles 18.2 mm; width 6.5 mm.

Head, pronotum and elytra black, with strong blue lustre. Mandibles, palps, antennae and legs black. Eyes convex; temples briefly oblique, converging to neck; labrum distinctly convex forward; clypeus smooth, convex forward; centre of frons weakly convex. Pronotum slightly longer than wide, cordiform, maximum width at basal third, punctate. Elytra oval, convex, maximum width at midlength; elytral surface smooth; primary intervals moderately raised, developed as longer tubercles, without intermediate primary foveae. Secondaries and tertiaries irregularly slightly punctate.

**Differential diagnosis.** Allied to *Cychnus (Cychropsis) gongga* Deuve et Vigna Taglianti, 1991 (Plate 1: Fig. 2), but differing from it in the following respects:

- 1) Statue slightly more slender than *C. gongga*; pronotum: max. width to max. length ratio 0.98 in new species but 1.09 in *C. gongga*; elytra: max. length to max. width ratio 1.77 in new species but 1.66 in *C. gongga*.
- 2) Pronotum less constricted at base than in *C. gongga*; max. width to width at base ratio 1.52 in new species but 1.64 in *C. gongga*.
- 3) Apex of aedeagus less constricted in dorsal view than in *C. gongga* (Figs. 1a, 2a) and more convex in lateral view than in *C. gongga* (Figs. 1b, 2b).

**Etymology.** The species name draws attention to the close similarity with *C. gongga* Deuve et Vigna Taglianti, 1991.

**Associated taxa.** The new species has been collected in the upper forest zone (3500 m elev.) sympatrically with *Cychnus (Shuocychnopsis) huangcao* sp. nov.

### *Cychnus (Cychropsis) draconis jiudingensis* ssp. nov.

(Plate 1: Figs. 3, 3a, 3b)

**Type material.** Holotype (♂) labelled: "China, C-Sichuan, 3000 m / Maoxin-Jiuding Shan / N 31°40'03", E 103°52'33" / 8.vi.2007, lgt. Janata M."; in collection of Miroslav Janata (Praha, Czech Republic).

**Description.** A larger *Cychropsis* species exerting a habitus typical of the *Cychropsis* Boileau, 1901, *C. draconis* species group. Length including mandibles 19.5 mm, width 6.9 mm. Black, with strong blue lustre on head, pronotum and elytra.

Head, pronotum and elytra black, with strong blue lustre. Mandibles, palps, antennae and legs black. Eyes convex; temples briefly oblique, converging to neck; labrum distinctly convex forward; clypeus smooth, convex forward; centre of frons weakly convex. Pronotum

slightly longer than wide, cordiform, maximum width in basal third, punctate. Elytra oval, convex, maximum width immediately behind midlength; elytral surface smooth; primary intervals moderately raised, developed as rather short tubercles, without intermediate primary foveae. Secondaries and tertiaries irregularly punctate.

**Differential diagnosis.** Allied to *Cychrus (Cychropsis) janataianus* (Deuve, 2007, plate 1: Fig. 4), found together in the same place but differing from it in the following respects:

- 1) Statue wider; pronotum more transverse, 1.1 in new ssp., 0.88 in *C. janataianus*; elytra less slender, 1.59 in new ssp., 1.81 in *C. janataianus*; humeral calli not indicated (as in *C. janataianus*), max. elytral width in posterior third, in *C. janataianus* at midlength.
- 2) Palps and antennae black, body with strong bluish lustre; in *C. janataianus* lustre rather metallic bronze, palps and ends of antennae reddish.
- 3) Apex of aedeagus markedly narrower in dorsal view than in *C. janataianus* (Figs. 3a, 4a) and more extended, in lateral view prolonging its convexity; in *C. janataianus* apex in lateral view shorter and not as convex (Figs. 3b, 4b).

**Etymology.** Named after the place of its occurrence. Jiuding Shan is a mountain range northeast of the town of Wenchuan in the north of the Sichuan Province.

*Cychrus (Shuocychropsis) huangcao* sp. nov.

(Plate 2: Fig. 5)

**Type material.** Holotype (♀) labelled: "China - Sichuan, VIII – 2012 / North of Shimian / Huangcao Shan, 3500 m"; in collection of R. Sehnal, to be deposited at the National Museum, Praha, Czech Republic.

**Description.** Rather small *Cychrus* species exerting a habitus typical of the subgenus *Shuocychropsis* Imura, 2002. Length including mandibles 15.5 mm; width 5.7 mm.

Head, pronotum and elytra black, with faint bronze lustre and strong blue lustre. Mandibles, palps, antennae and legs black or brownish black. Eyes convex; temples briefly oblique, converging to neck; labrum distinctly convex forward; clypeus smooth, convex forward; centre of frons weakly convex. Pronotum slightly longer than wide, cordiform, maximum width in basal third, sporadically punctate. Elytra oval, convex, maximum width immediately behind midlength; elytral surface smooth; primary intervals moderately raised, developed as short tubercles, without intermediate primary foveae. Secondaries and tertiaries irregularly punctate.

**Differential diagnosis.** Allied to *Cychrus (Shuocychropsis) brezinai* Deuve, 1993 (Plate 2: Fig. 6), but differing from it in the following respects:

Pronotum slightly more transverse, 1.34 in *C. huangcao* sp. nov. against 1.08-1.11 in *C. brezinai* Deuve, 1993. Elytra of both species in lateral view equally convex with depression in front of apex, and in dorsal view equally ovoid with rounded humeri, but markedly more stretched in new species - max. length to max. width ratio 1.70 in *C. huangcao*, 1.48 in *C. brezinai*. In both species, elytra mostly densely rugate. Sculpture is reduced only near elytral base, in *C. huangcao* the reduction reaches at most one quarter the elytra length, whereas

in *C. brezinai* it does not exceed one sixth the elytral length. Beading (elevated interrupted sections of intervals) is markedly more spaced out in *C. brezinai* (elevated sections are short and remind of tubercles), whereas in *C. huangcao* beads are closely spaced and longer (columnar).

**Etymology.** Named after the place of its occurrence. Huangcao Shan is a mountain range north of the town of Shimian in the south of the Sichuan Province.

**Associated taxa.** The new species was collected in the upper forest zone (3500 m elev.) sympatrically with *Cychrus* (*Cychropsis*) *gonggoides* sp. nov.

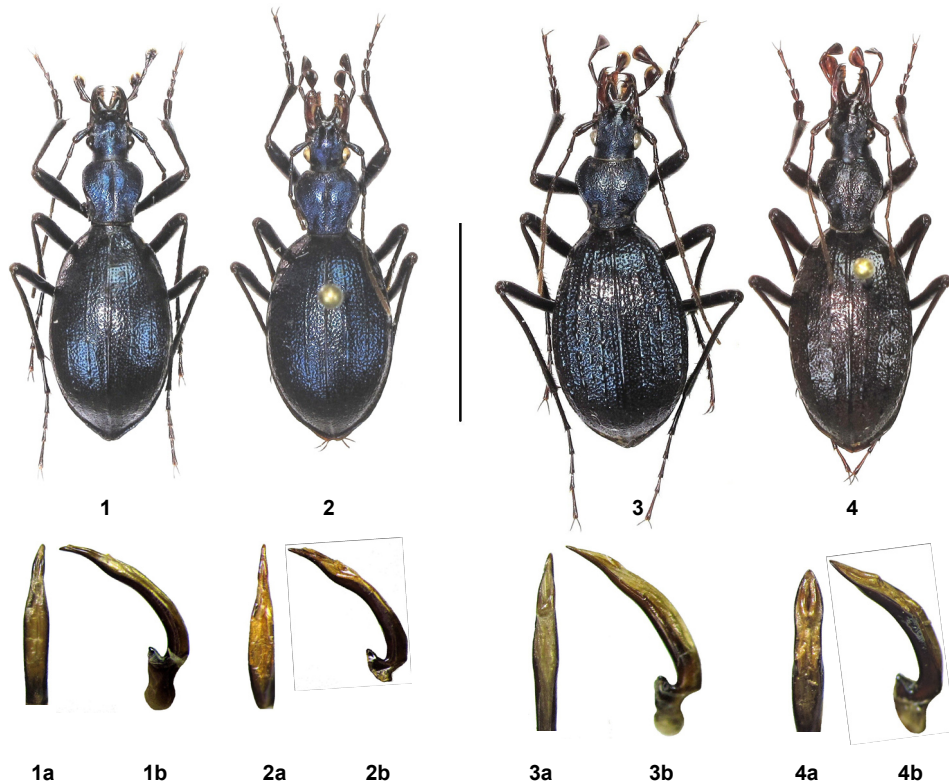
## DISCUSSION

*Cychrus* (*Cychropsis*) *draconis jiudingensis* ssp. nov. The holotype was collected at the same locality and at the same time as the type series of *C. (Cychropsis) janataianus* (Deuve, 2007), from which the new subspecies clearly differs, namely in the shape of the pronotum and aedeagus (Figs. 3a, 3b, 4a, 4b). Deuve (1990) originally described *C. janataianus* as a subspecies of *C. draconis*. Since the two above mentioned taxa are doubtlessly sympatrically living separate species, it appeared necessary to propose a species status for *C. d. jiudingensis*. Deuve (2013) subsequently recognized the differences between *C. janataianus* and *C. draconis* and elevated *C. janataianus* to a full species. These conclusions are in accord with our observations, because the new taxon described here does not morphologically differ much from *C. draconis* s. str. and we therefore regard it as a subspecies. The sympatric occurrence of *C. draconis jiudingensis* sp. nov. and *C. janataianus* (Deuve, 2007) supports the view that the latter taxon is a full species (Deuve 2013).

The occurrence of the remaining two taxa described here, *C. (Cychropsis) gonggoides* sp. nov. and *C. (Shuocychropsis) huangcao* sp. nov., further documents the sympatry of two *Cychrus* species in the Sinotibetian north-south oriented mountain chains (Daxue Shan) of Sichuan and Yunnan provinces. They are a larger species of the subgenus *Cychropsis* (in the *C. draconis* group) and a smaller species of the subgenus *Shuocychropsis*, respectively. We first mentioned this sympatry while describing two species from Jinping Shan, the southernmost end of Sichuan section of the Daxue Shan Range (Häckel & Sehnal 2006).

Nowadays such sympatry is known from the following six localities:

- 1) The Gongga massif (Sichuan) in the Hailuoguo National Park - *C. (Cychropsis) gongga* (Deuve et Vigna Taglianti, 1992) and *C. (Shuocychropsis) brezinai*, 1993.
- 2) West of Muli (Sichuan) - *C. (Cychropsis) infernalis* (Cavazzuti, 1996) and *C. (Shuocychropsis) casalei* Cavazzuti, 1996.
- 3) A site on the southern shore of Lake Lugu in the mountains of northernmost Yunnan, which forms a southern extension of the Daxue Shan massif - *C. (Cychropsis) lucifer* (Cavazzuti, 1996) and *C. (Shuocychropsis) coronatus* Cavazzuti, 1996.
- 4) In the southern part of the Daxue Shan massif (Sichuan) north of the town of Eryizuxiang on the border of the Jiulong and Mianing districts - *C. (Cychropsis) kabaki* (Imura et Häckel, 2003) and *C. (Shuocychropsis) cyanicollis* (Imura et Häckel, 2003).



Figs. 1-4. *Cychrus* (*Cychropsis*) *gonggoides* sp. nov. (holotype male): 1a- aedeagus, apex in anterior view; 1b- aedeagus, in right lateral view; *Cychrus* (*Cychropsis*) *gongga* (Deuve et Vigna Taglianti, 1991), male Gongga Shan, Sichuan: 2a- aedeagus, apex in anterior view; 2b- aedeagus, in right lateral view; *Cychrus* (*Cychropsis*) *draconis jiudingensis* ssp. nov. (holotype male): 3a- aedeagus, apex in anterior view; 3b- aedeagus, in right lateral view; *Cychrus* (*Cychropsis*) *janataianus* (Deuve, 2007), male Jiuding Shan, Sichuan: 4a- aedeagus, apex in anterior view; 4b- aedeagus, in right lateral view. Bar equals 10 mm.

- 5) Jinping Shan in the southernmost part of Sichuan - *C. (Cychropsis) sehнали* (Häckel, 2006) and *C. (Shuocychropsis) paramontanus* (Sehnal et Häckel, 2003).
- 6) Huangcao Shan north of the Shimian City south of the Gongga Shan massif (Sichuan) - *C. (Cychropsis) gonggoides* sp. nov. and *C. (Shuocychropsis) huangcao* sp. nov.

It is possible that further data and a thorough revision of the two subgenera will result in merger of the two sympatric groups into a single species pair, *C. (Cychropsis) gongga* (Deuve et Vigna Taglianti, 1992) (incl. *gonggoides*, *infernalis*, *lucifer*, *kabaki*, *sehнали*) and *C. (Shuocychropsis) brezinai*, 1993 (incl. *casalei*, *coronatus*, *cyanicollis*, *huangcao* and *paramontanus*), with populations currently viewed as species becoming subspecies.



Figs. 5-6. *Cychrus* (*Shuocyhropsis*) *huangcao* sp. nov. (holotype female): 5- habitus dorsal aspect; *Cychrus* (*Shuocyhropsis*) *brezinai* Deuve, 1993, paratype female Gongga Shan, Sichuan: : 6- habitus dorsal aspect. Bar equals 10 mm.

CATALOGUE AND DISTRIBUTION OF SPECIES OF THE  
*CYCHRUS* SUBGENERA *CYCHROPSIS* AND *SHUOCYCHROPSIS*

**genus:** *Cychrus* Fabricius, 1794

**subgenus:** *Cychrus* s. str. (more than 180 described species)  
 = *Kryptocyhrus* Cavazzuti, 1997

**subgenus:** *Cychropsis* Boileau, 1901 (38 species)  
 = *Sinocyhropsis* Imura, 2001

*businskyi* group:

- 1 *businskyi* (Deuve, 1992)
- ssp. *basumtsoensis* (Deuve, 2001)
- ssp. *businskyi* (Deuve, 1992)

(Tibet Plateau)  
 sw China: Xizang



ssp. <i>laevigatus</i> (Cavazzuti, 2003)	
<b>2</b> <i>conaensis</i> (Deuve et Tian, 2009)	sw China: Xizang
<b>3</b> <i>liangi</i> Deuve, 2013	sw China: Xizang
<b>4</b> <i>namchabarwanus</i> (Imura, 1999)	sw China: Xizang
<b>5</b> <i>yuianus</i> Deuve, 2013	sw China: Xizang
<b>dracónis</b> group:	(Sinotibetan mountains)
<b>6</b> <i>beatepuchneri</i> (Kleinfeld et Puchner, 2007)	China: Sichuan
<b>7</b> <i>belzebuth</i> (Deuve et Mourzine, 2009)	China: Sichuan
<b>8</b> <i>bousqueti</i> (Deuve, 1991)	China: Sichuan
ssp. <i>bousqueti</i> (Deuve, 1991)	
ssp. <i>dandoensis</i> (Deuve, 2007)	
ssp. <i>erwanrozoï</i> (Deuve, 2012)	
<b>9</b> <i>diabolicus</i> (Deuve, 2012)	China: Sichuan
<b>10</b> <i>draconis</i> (Deuve, 1990)	China: Sichuan
ssp. <i>draconis</i> (Deuve, 1990)	
ssp. <i>erlangshanensis</i> (Kleinfeld, 2000)	
ssp. <i>gnathochaetus</i> (Deuve, 1998)	
ssp. <i>gorodinskiianus</i> (Deuve, 2011)	
ssp. <i>jiudingensis</i> ssp. nov.	
ssp. <i>maoniensis</i> (Deuve, 1996)	
<b>11</b> <i>giganteus</i> (Deuve, 1992)	China: Sichuan
ssp. <i>giganteus</i> (Deuve, 1992)	
ssp. <i>hungi</i> (Kleinfeld, 2000)	
<b>12</b> <i>gongga</i> (Deuve et Vigna Taglianti, 1992)	China: Sichuan
<b>13</b> <i>gonggoides</i> sp. nov.	China: Sichuan
<b>14</b> <i>infernalis</i> (Cavazzuti, 1996)	China: Sichuan, Yunnan
ssp. <i>cyanicolor</i> (Deuve, 2006)	
ssp. <i>infernalis</i> (Cavazzuti, 1996)	
<b>15</b> <i>janataianus</i> (Deuve, 2007)	China: Sichuan
<b>16</b> <i>kabaki</i> (Imura et Häckel, 2003)	China: Sichuan
<b>17</b> <i>korelli</i> (Kleinfeld, 1999)	China: Sichuan
ssp. <i>kazantsevi</i> (Deuve, 2000)	
ssp. <i>korelli</i> (Kleinfeld, 1999)	
ssp. <i>subkazantsevi</i> (Deuve, 2001)	
<b>18</b> <i>lucifer</i> (Cavazzuti, 1996)	China: Sichuan
ssp. <i>lucifer</i> (Cavazzuti, 1996)	
ssp. <i>mianningensis</i> (Deuve et Mourzine, 2009)	
<b>19</b> <i>nagahatai</i> (Imura, 2004)	China: Sichuan
<b>20</b> <i>sehnali</i> (Häckel, 2006)	China: Sichuan
<b>21</b> <i>tiani</i> (Deuve, 2011)	China: Sichuan
<b>22</b> <i>tryznai</i> (Häckel et Sehnal, 2007)	China: Sichuan
<b>sikkimensis</b> group:	(Himalaya)
<b>23</b> <i>dembickyi</i> (Imura, 2005)	ne India: Arunachal Pradesh

- 24 *deuvei* (Korell et Kleinfeld, 1987) Nepal  
 ssp. *abuthumensis* (Deuve et Schmidt, 2005)  
 ssp. *deuvei* (Korell et Kleinfeld, 1987)  
 ssp. *manasluensis* (Deuve et Schmidt, 2005)
- 25 *fuscotarsalis* (Deuve, 2003) Nepal  
 = *janetscheki* Mandl, 1987 (partim)
- 26 *janetscheki* (Mandl, 1970) Nepal  
 ssp. *janetscheki* (Mandl, 1970)  
 ssp. *thamensis* Deuve, 2013
- 27 *hartmanni* (Deuve et Schmidt, 2005) Nepal
- 28 *mandli* (Paulus, 1971) Nepal  
 ssp. *eremicola* (Deuve et Schmidt, 2005)  
 ssp. *heinzi* Deuve, 2013 nom. nov. pro *C. schmidti* (Heinz, 1994)  
 = *schmidti* Heinz, 1994 (junior homonym of *C. schmidtii* Chaudoir, 1837)  
 ssp. *jeanimarcilhaci* (Deuve, 2003)  
 ssp. *mandli* (Paulus, 1971)  
 ssp. *tenuoritarsalis* (Deuve & Schmidt, 2005)
- 29 *martensi* (Heinz, 1994) Nepal
- 30 *nepalensis* (Mandl, 1965) Nepal
- 31 *shiva* (Deuve et Schmidt, 2010) Nepal
- 32 *sikkimensis* Fairmaire, 1901 ne India: Sikkim
- 33 *surkiensis* (Deuve, 2003) Nepal  
 ssp. *surkiensis* (Deuve, 2003)  
 ssp. *tenuithorax* Deuve, 2013
- 34 *tuberculipennis* (Mandl, 1987) Nepal  
 ssp. *deoraliensis* Deuve, 2013  
 ssp. *tuberculipennis* (Mandl, 1987)
- 35 *veiperti* (Deuve et Schmidt, 2010) Nepal
- 36 *weigeli* (Deuve et Schmidt, 2007) Nepal
- 37 *wittmeri* (Mandl, 1975) Bhutan; ne India: Sikkim; Nepal  
 = *sikkimensis* Fairmaire, 1901 (partim)
- 38 *wittmerianus* (Deuve, 1983) ne India: Darjeeling, West Bengal; Nepal  
 ssp. *makalu* (Deuve, 2003)  
 ssp. *morvaniana* (Deuve, 2003)  
 ssp. *wittmerianus* (Deuve, 1983) (nom. nov. pro *sikkimensis* Mandl, 1975)
- subgenus: *Shuochropsis* Imura, 2002b (10 species)
- 1 *brezinai* Deuve, 1993 China: Sichuan
- 2 *casalei* Cavazzuti, 1996 China: Sichuan
- 3 *coronatus* Cavazzuti, 1996 China: Yunnan
- 4 *cyanicollis* (Imura et Häckel, 2003) China: Sichuan



- 5** *huangcao* sp. nov. China: Sichuan  
**6** *malacophilus* Deuve et Mourzine, 2010 China: Sichuan  
**7** *meihuanae* Imura, 1998 China: Sichuan  
 ssp. *helicophilus* Deuve et Mourzine, 2009  
 ssp. *meihuanae* Imura, 1998  
**8** *okamotoi* Imura, Su et Osawa, 1998 China: Sichuan  
 ssp. *okamotoi* Imura, Su et Osawa, 1998  
 ssp. *shamaevi* Deuve, 1999  
**9** *paramontanus* (Sehnal et Häckel, 2006) China: Sichuan  
**10** *poggii* (Cavazzuti, 2010) China: Sichuan

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